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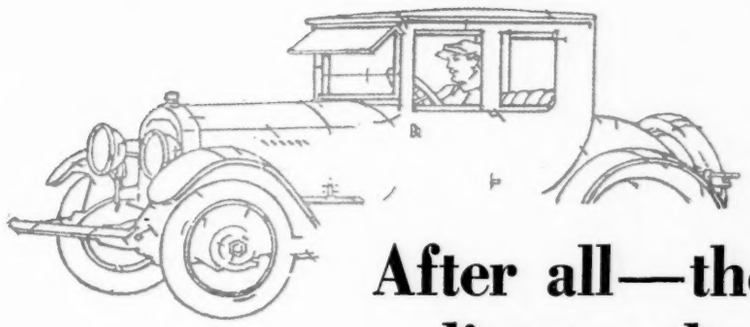

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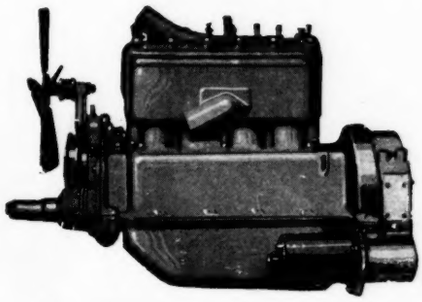

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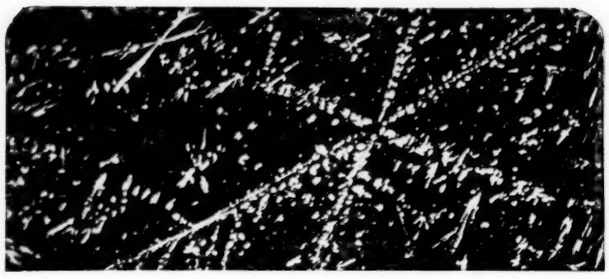

Note the Large Crystallization In This Bearing

MICROPHOTOGRAPH of a bearing used by a well-known automobile, enlarged 100 diameters. To the naked eye it looks like a good bearing. Undoubtedly the car manufacturer thinks it is a good bearing. But notice the large and uneven crystallization—which means a lining of varying character and one which wears unevenly. This large crystallization is due to the slow rate of cooling and to the unavoidable variation of pressure during the lining process. This picture graphically shows the physical and structural defects, which while not visible to the naked eye, do, nevertheless, greatly shorten the life of such a bearing.

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DETROIT — MICHIGAN

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLVI. NEW YORK—THURSDAY, FEBRUARY 16, 1922 No. 7

12,588,949 Motor Vehicles in Use Throughout the World

United States owns 83 per cent of cars and trucks in existence. Europe has 1,110,996. Nearly 250,000 are in Spanish speaking countries. Analysis shows good export market for American automotive products.

By David Beecroft

THE best available statistics show that there are 12,588,949 cars and trucks in the world. This figure has been obtained after a careful and comprehensive investigation, including every country and covering a period of some six months. The results are not perfect but are presented as the most comprehensive and accurate available at the present time.

Outside of the United States there are 2,083,289 cars and trucks. These are distributed through every country and every continent in the world and indicate the widespread progress of automotive development. It is true, however, that a large part of these vehicles are in the English-speaking countries. The United States, Great Britain and Canada have about 91 per cent of the automobiles in the world, while Australia, Newfoundland, etc., add to the predominance of the English-speaking nations from an automotive viewpoint. United States alone, with its 10,505,660 registration in 1921, has over 83 per cent of the world total; Canada a little over 3.5 per cent and Great Britain nearly 4 per cent.

Because the United States includes so large a percentage of total automobile registrations, it is necessary to eliminate its total from most discussions of world statistics, if such discussions are to serve any practical purpose. The United States is in a class by itself so far as automotive selling problems are concerned. Consequently, the United States registration figures are treated as a separate unit in an article on later pages.

Divided into major continental classifications, the world registrations line up as follows:

North and South America	11,162,110
Europe	1,110,996
Asia	134,730
Oceania	125,281
Africa	55,832

From the point of view of the American exporter, the English-speaking countries with the largest registration are not of major interest, since the foreign market for his product lies elsewhere for the most part. It is more interesting from an export standpoint, therefore, to discuss world registration figures in foreign countries other than Canada and Great Britain.

Excluding the motor vehicles in the United States, Great Britain and Canada, the total for the remainder of the world amounts to about 1,122,259. An arbitrary division of these remaining registrations may be made for market study as follows:

Spanish speaking countries	241,584	21.6%
Europe (exclusive of Great Britain, Spain, Portugal, Azores)	570,774	50.8%
Africa (exclusive of Port. East Africa, Madeira Is.)	55,332	4.9%
Oceania (exclusive of Philippine Islands)	112,900	10.1%
Asia	134,730	12.0%
North and South America (exclusive of Spanish speaking countries, U. S. A., Canada)	6,939	.6%
World total (exclusive of U. S. A., Canada, Great Britain)	1,122,259	

The Spanish-speaking countries included in the foregoing total are indicated in an accompanying table. This list brings out certain points of major interest to the American exporter. The basis of computing the per-centages is sound from an export point of view, because those countries outside the United States and Canada are of chief interest as possible markets.

The tabulation indicates that just about half of the remaining total of cars and trucks are owned in European countries. France, Russia, Germany and other smaller European nations, however, are not of particular interest from an export view at the present time due to the generally unsettled economic conditions in those areas.

In certain European countries, moreover, there is active domestic production of motor vehicles, notably in France, Italy, Germany and Belgium. This home competition will always be a large factor of sales resistance to American products.

The countries which already have a considerable number of cars, however, are likely to prove the most accessible to the American exporter, since he is not under so great a necessity of selling the idea of motor transportation.

A detailed analysis of registration distribution is necessary, however, if maximum value is to be derived from these world statistics. The value of the various countries as export markets depends partly upon the registration figures, but chiefly upon other economic factors peculiar to the individual territory. While it is impossible within the limits of a brief article to discuss all these factors in detail, a brief survey of each country will serve to bring out clearly the lights and shades in this comprehensive picture of the world automotive situation.

World Registration of Cars and Trucks

United States	10,505,660	Algeria	12,000	Jamaica	1,350
Great Britain	497,582	Poland	10,700	British Guiana	1,050
Canada	463,448	Chile	10,000	Barbados	1,000
France	236,146	Uruguay	10,000	Canary Islands	881
Germany	91,384	Roumania	8,500	New Foundland	600
Argentina	75,000	China	8,150	British West Africa	566
Australia	73,900	Federated Malay States	8,000	Ecuador	500
Italy	53,000	Porto Rico	6,500	Guatemala	500
India	45,983	Turkey	5,500	Guadeloupe	500
Dutch East Indies	45,000	Ceylon	5,350	Paraguay	500
Spain	37,560	Egypt	5,084	Salvador	400
New Zealand	37,500	Portugal	5,000	Portuguese East Africa	400
Russia	35,000	Czechoslovakia	4,133	Nicaragua	370
Belgium	33,200	Gold Coast	3,500	Bolivia	300
Union of South Africa	26,468	Peru	3,343	Angola	250
Brazil	25,000	Venezuela	2,500	French West Africa	230
Mexico	25,000	Morocco	2,500	Costa Rica	200
Denmark	22,260	Indo-China	2,300	Honduras	200
Cuba	20,000	Trinidad	2,221	Madagascar	159
Switzerland	18,011	Siam	2,187	Bahama	150
Austria	16,350	Colombia	2,000	Madeira Islands	100
Norway	14,340	Tunis	1,990	Azores	80
Sweden	14,250	Panama	1,950	British Honduras	68
Holland	13,500	Dominican Republic	1,800	Italian Somaliland	66
Philippine Islands	12,381	Mauritius Island	1,600	Reunion Island	35
Japan	12,260	Hawaii	1,500	Monrovia	3
					12,588,949

North and South America

NORTH and South America are far in the lead of other continents as regards the total number of motor vehicles in use. There are 11,162,110 cars and trucks in use in North and South America, the vast majority, of course, being in the United States, which in 1921 has registered a total of 10,505,660.

This leaves a total of 656,450 for these areas outside of continental United States. About 70 per cent of this is included in Canada, where a registration gain of 60,337 has been attained over 1920. The remaining 193,002

United States	10,505,660	Porto Rico	6,500	British Guiana	1,050	Nicaragua	370
Canada	463,448	Peru	3,343	Barbados	1,000	Bolivia	300
Argentina	75,000	Venezuela	2,500	Newfoundland	600	Honduras	200
Brazil	25,000	Trinidad	2,221	Paraguay	500	Costa Rica	200
Mexico	25,000	Colombia	2,000	Ecuador	500	Bahama	150
Cuba	20,000	Panama	1,950	Guatemala	500	British Honduras	68
Chile	10,000	Dominican Republic	1,800	Guadeloupe	500		
Uruguay	10,000	Jamaica	1,350	Salvador	400	Total	11,162,110

cars and trucks are scattered through the South and Central American countries, Argentina, Brazil and Mexico leading this group with totals of 75,000, 25,000 and 25,000 respectively.

The Dominion of Canada occupies the distinction of ranking third in the countries of the world in motor vehicle population, being led by the United States and Great Britain, the latter made up of England, Scotland, Ireland and Wales. Canada had 463,448 motor vehicles on Dec. 31, 1921, as compared with 403,111 one year ago.

Canada, with its area equal to that of the United States or Brazil, or Australia or the Continent of Europe, has 7,200,000 population; has 1 car for every sixteen persons, as compared to 1 car for every 10 persons in the United States. The Province of Ontario, a rich agricultural and manufacturing province, has nearly one-half the cars of the Dominion. The division of cars among the different provinces as of Dec. 1, 1921, and as of Dec. 31, 1900, are:

Province	December 31, 1921	December 31, 1920
Ontario	200,900	171,500
Saskatchewan	63,370	60,749
Alberta	39,835	38,015
British Columbia	32,724	28,200
Quebec	59,707	43,500
Nova Scotia	13,940	12,198
New Brunswick	12,103	11,421
Prince Edward Island	1,200	1,073
Manitoba	39,669	36,455
	463,448	403,111

The prairie agricultural province of Saskatchewan leads the old province of Quebec by nearly 4000 vehicles. The lack of good roads in western Canada is holding back the sale of motor vehicles.

Quebec has led all the other provinces in good roads with permanent hard surfaces, but in the last three years Ontario has adopted a provincial policy and has been carrying on an extensive highway program.

Argentina has 75,000 cars and trucks. This is an estimate, as total registrations for the country, with its 9,000,000 population, are not available. Argentina ranks sixth among the nations of the world in motor population, being led by the United States, Great Britain, Canada, France and Germany. Buenos Aires, the capital, the largest city in the world south of the equator, has, with its 1,800,000 population, 15,000 cars, of which 6500 are used for taxicab and hire purposes. In the other cities of Argentina, such as Rosario, Cordoba, La Plata, Bahia Blanca, Mendoza, Tucuman and Santa Fe are 10,000 more vehicles, leaving 50,000 in the rural part of the country. Some careful estimates place the total automobiles in Argentina at 80,000.

It is only in recent years that Ford has started assembling in Argentina, so that most of the motor vehicles have been imported. From 1910 to Sept. 30, 1920, a total of 65,275 vehicles were imported. Ford has assembled in Buenos Aires about 25,000 vehicles, although the Fords sold in that country practically double this figure.

During 1921 the imports into Argentina from Jan. 1 to September were: Cars, 414; trucks, 57. These were divided between European and North American manufacturers as follows:

	United States	Europe
Cars	328	86
Trucks	7	50

Of the European trucks 24 were used models.

The imports of cars and trucks into Argentina since 1900 follow:

	Cars		Cars
1900	9	1910	1,581
1901	16	1911	2,461
1902	28	1912	4,281
1903	62	1913	5,115
1904	129	1914	2,185
1905	377	1915	1,847
1906	712	1916	5,929
1907	610	1917	11,031
1908	495	1918	5,926
1909	831	1919	4,594

Ownership of Cars and Trucks by Countries

Algeria	12,000	Egypt	5,084	Nicaragua	370
Angola	250	Federated Malay States	8,000	Norway	14,340
Argentina	75,000	France	236,146	Panama	1,950
Australia	73,900	French West Africa	230	Paraguay	500
Austria	16,350	Germany	91,384	Peru	3,343
Azores	80	Gold Coast	3,500	Philippine Islands	12,381
Bahama	150	Great Britain	497,582	Poland	10.700
Barbados	1,000	Guadeloupe	500	Porto Rico	6,500
Belgium	33,200	Guatemala	500	Portugal	5,000
Bolivia	300	Hawaii	1,500	Portuguese East Africa	400
Brazil	25,000	Holland	13,500	Reunion Island	35
British Guiana	1,050	Honduras	200	Roumania	8,500
British Honduras	68	India	45,983	Russia	35,000
British West Africa	566	Indo China	2,300	Salvador	400
Canada	463,448	Italian Somaliland	66	Siam	2,187
Canary Islands	881	Italy	53,000	Spain	37,560
Ceylon	5,350	Jamaica	1,350	Sweden	14,250
Czechoslovakia	4,133	Japan	12,260	Switzerland	18,011
Chile	10,000	Madagascar	159	Trinidad	2,221
China	8,150	Madeira Islands	100	Tunis	1,990
Colombia	2,000	Mauritius Island	1,600	Turkey	5,500
Costa Rica	200	Mexico	25,000	Union of South Africa	26,468
Cuba	20,000	Monrovia	3	United States	10,505,660
Denmark	22,260	Morocco	2,500	Uruguay	10,000
Dominican Republic	1,800	New Foundland	600	Venezuela	2,500
Dutch East Indies	45,000	New Zealand	37,500		12,588,949
Ecuador	500				

During the first six months of 1920 there were imported 7284 cars and 102 trucks.

Brazil, with an area equal to that of the United States, and a population of 30,000,000, has 25,000 motor vehicles. This is an estimate, as registrations for the many states comprising Brazil are not available. An estimate places trucks at 1000. These vehicles are distributed partially as follows, this distribution being an estimate and not based on registrations:

Rio de Janeiro district	4,000 to 5,000
Sao Paulo district	4,000 to 6,000
Pernambuco	1,000
Southern Brazil	6,000
Central Interior	3,000
Northern Interior	2,000

There were registered in Pernambuco in August, 1920, cars, 851; truck, 127; motorcycles, 8. A year later the registration was: Cars, 633; trucks, 173; motorcycles, 15. The reduction in the number of cars is probably due to late registration.

Ford has established an assembly branch at Sao Paulo, which in recent months has reported extensive improvement in sales.

Mexico's motor population at 25,000 cars and trucks, is based on 8000 vehicles being added in 1921, which was the greatest year for the motor vehicle in Mexico, to the estimate of 18,000 being in the country at the end of 1920. Registration figures for the City of Mexico in August, 1921, gave a total of 9066 vehicles, made up of private cars, 4015; taxicabs, 4166; buses, 363; Government cars, 309; trucks, 214. To this can be added 265 motorcycles. In 1919, there were 20 different makes of automobiles in Mexico, and in 1920 the number had increased to 43. Mexico is the only country that imported more automobiles in 1921 than in 1920, and the most careful estimates show that the automotive registration in Mexico increased from 40 to 50 per cent during last year.

Cuba is estimated to have 20,000 cars and trucks, of which 20 or 25 per cent are motor trucks. This estimate is based on reports from United States consuls for their various districts. The Province of Habana, which includes the city of Havana, in the latter part of 1921, had registrations of 10,216 cars, 2958 trucks and 166 motorcycles. During 1920, approximately 2800 cars were sold in this district, and in the first seven months of 1921 approximately 800 more were sold.

Chile is estimated to have 10,000 cars and trucks. In 1919, the most reliable figures showed 8000 vehicles in the country. In that year the registrations in some of the cities were:

Santiago	3,238	Iquique	86
Valparaiso	575	Valdivia	51
Antofagasta	311	Curico	69
Punta Arenas	311	Talca	80
Concepcion	391		

During 1921, there were imported into Antofogasta 180 cars, 60 trucks, 40 taxicabs and 10 motocycles. The roads within the limits of this city are excellent. In Punta Arenas, 610 cars have been imported, and 93 motor trucks. In the district are 35 motorcycles.

Uruguay, the smallest country in South America, and with but 1,250,000 population, has more good roads than any other country on the continent, which explains why it has 10,000 motor vehicles. In Montevideo are registered 7461 cars, and there were imported into Uruguay from 1903 to May 31, 1921, a total of 13,194 vehicles.

There are 573 motorcycles in Uruguay, of which 500 are in Montevideo. Of the 573 motorcycles, 461 are of North American manufacture. There are not over 100 users of motor trucks in Uruguay.

Porto Rico, with from 6000 to 6500 vehicles, is using the motor vehicle to supply transportation not furnished by railroads. Bus line transportation has reached large proportions on the island. In the last two years the use of motor vehicles has increased rapidly, as at that time there were 4324 cars, 210 trucks and 210 motorcycles in operation.

An estimate of 3343 motor vehicles in Peru is not based on registration figures, as such are not obtainable. Exports from the United States to Peru totaled 3565 cars and 1267 trucks. In 1917 Peru imported 582 vehicles. In 1918 she imported 607 and in 1919 there were 609. The registrations for Lima, the capital, are given as 2229, consisting of 629 cars for hire, 1300 for private use and 300 trucks.

Estimating 2500 motor vehicles in Venezuela is an approximation, and of this number, 10 per cent is trucks. Caracas, the capital, has 505 cars. Different United States consuls have given reports for their districts which estimate the motor vehicles as follows: Peurto Cabello, 500 cars and trucks, and Maracaibo, 325 cars. There are 45 farm tractors in the country.

Colombia is estimated to have 2000 cars and trucks. During the first six months of 1920, approximately 1000 cars were imported through the port of Barranquilla. Not over 12 farm tractors are in use in this district. In Cartagena are 90 cars, 20 trucks and 10 motor buses. In Santa Marta are 42 cars and two trucks. Trade estimates give Barranquilla a total of 332 cars, 24 trucks and 31 motor buses. Total imports in 1920 were 1200 vehicles.

The Dominican Republic on Jan. 1, 1921, had 1644 cars and trucks registered. Of this total 560 cars were imported in 1920 and 211 in 1919. All of the cars are of North American manufacture. There are 50 motorcycles in the country. A dozen farm tractors have been sold in the last two years.

The Republic of Panama and the Canal Zone, but not including the city of Colon, have 1750 cars and trucks. The city of Colon has licensed 200 vehicles, including 50 trucks. There are four tractors and 15 motorcycles in the Republic.

Costa Rica his issued 220 motor car registrations. The imports for 1919 and 1920 have not been published. In the first ten months of 1921 there were sold 33 vehicles. There are 12 motorcycles in Costa Rica and 23 motor trucks.

Car Ownership in Spanish Speaking Countries

Argentina	75,000
Spain	37,560
Brazil	25,000
Mexico	25,000
Cuba	20,000
Philippine Islands	12,381
Chile	10,000
Uruguay	10,000
Porto Rico	6,500
Portugal	5,000
Peru	3,343
Venezuela	2,500
Colombia	2,000
Panama	1,950
Dominican Republic	1,800
Ecuador	500
Guatemala	500
Paraguay	500
Salvador	400
Portuguese East Africa	400
Nicaragua	370
Bolivia	300
Costa Rica	200
Honduras	200
Madeira Islands	100
Azores	80
	241,584

Nicaragua has 370 motor vehicles made up of 350 cars and 20 trucks. During 1920 there were imported from the United States 184 cars. Not over 25 per cent of this number were imported in 1921. There are 8 farm tractors and 6 motorcycles.

Honduras has 200 motor vehicles, divided among different districts. The Tegucigalpa district has 60 cars, 10 trucks and 5 motorcycles. The Ceiba district has 59 cars, 9 trucks and 5 motorcycles. The Puerto Cortes district has 48 cars and trucks.

Guatemala has 500 motor vehicles, of which 90 per cent are in Guatemala city. This number includes 40 trucks. In 1919 there were imported 126 cars, all from the United States; in 1920 the number was 165 from the United States and 1 from England and 1 from Mexico. There are 50 farm tractors in the country.

Salvador has 400 motor vehicles. The majority of these are of American manufacture. The use of the motor bus is a recent development.

Ecuador has 500 motor vehicles, which includes 6 trucks. There are 8 farm tractors.

Haiti has 726 cars, trucks, tractors and motorcycles, made up as follows: Cars, 650; trucks, 40; motorcycles, 25; tractors, 11. During 1920 there were sold 60 cars and 15 trucks, and during nine months of 1921 sales were 20 cars and 12 trucks.

Bolivia has 300 motor vehicles. The exports from the United States to Bolivia prior to 1920 totaled 379 cars and 67 trucks, a total of 446.

Paraguay has 500 motor vehicles. The United States has exported to Paraguay 186 cars. Most of the cars are in the five cities, Asuncion, Villarica, Concepcion, Pilar and Encarnacion.

Jamaica had registered on Aug. 25, 1921, a total of 1350 automobiles. Trucks in use are estimated at 150. As compared with these figures there were in October, 1920, a total of 2010 vehicles registered, the drop in 1921 apparently indicating vehicles not in use. Not over 25 agricultural tractors are used on the island.

British Guiana, a British possession in South America, has 1050 cars and trucks, of which 159 were imported in 1920. To this can be added 150 motorcycles and 100 farm tractors. Importations of cars and trucks in 1921 were very small.

The British island of Barbados has 1035 cars and trucks, of which 35 are trucks. There are 150 motorcycles on the island. In 1920 Barbados imported 197 cars and in 1921 only 30. There are 12 farm tractors on the island. Barbados is largely given over to sugar plantations and has an excellent system of macadam roads over the entire island.

The island of Guadeloupe, a French possession in the West Indies, has 500 motor vehicles, this including 50 trucks. American makes dominate. Importations in 1921 were very limited, and in 1920 only 71 motor vehicles were imported from the United States and 32 from France.

Trinidad has 1961 motor cars, 200 motor trucks, and 60 motor buses. An analysis of motor importations shows:

1912	67	1917	196
1913	72	1918	114
1914	63	1919	246
1915	111	1920	624
1916	174		

Probably not over 100 vehicles were imported into Trinidad in 1921. There are 200 motorcycles on the island. Very few farm tractors have been imported.

British Honduras in October, 1921, had 56 cars and 12 trucks. Five farm tractors are used in the lumber industry. Lack of roads is responsible for the small number of vehicles, 75 per cent of which are for hire. Practically all cars and trucks imported have come from the United States.

Europe

MORE than a million cars are now in use throughout Europe, the total being 1,110,996, according to the figures obtained in this survey. The European countries best known as automobile producers lead the list in registrations. Great Britain is found at the top, while France, Germany and Italy follow in the order named.

Figures for many of the European countries have been difficult to obtain, since registration of motor vehicles is not carried out to the extent that it is in this country. Figures for Russia have been particularly hard to get because of the unsettled economic and political situation in that country. The figure for Russia used in the following tabulation is little more than an intelligent guess, since there is probably nobody in the world who can give a refinite figure as to how many cars and trucks are in that country.

Great Britain	497,582	Denmark	22,260	Roumania	8,500
France	236,146	Switzerland	18,011	Portugal	5,000
Germany	91,384	Austria	16,350	Czechoslovakia	4,133
Italy	53,000	Norway	14,340	Azores	80
Spain	37,560	Sweden	14,250		
Russia	35,000	Holland	13,500	Total	1,110,996
Belgium	33,200	Poland	10,700		

Great Britain, consisting of England, Scotland, Wales and Ireland, had on Aug. 31, 1921, a motor vehicle registration of 497,582. This was made up as follows:

Cars	242,500
Trucks	128,200
Hackneys	82,800
Farm Tractors	14,520
Road Locomotives	2,650
Ambulances	312
Motorcycles	173,200

When 373,200 motorcycles are added to the other motor vehicles it gives a grand total of 870,782 motor vehicles of all classifications. The 2650 road locomotives undoubtedly referred to steam vehicles, generally designated traction engines. Under motor hackney undoubtedly is included all taxicabs, and we are not certain if motor buses come under this classification. These figures from the Ministry of Transport are for the registration of the first nine months of the year. Figures are not available for the last three months. Great Britain has always been a great motorcycle country, and is one of the few in which more motorcycles are used than motor cars.

Basing calculations on 497,582 vehicles, and with a population of 48,000,000, there is one vehicle for approximately every 96 persons. The total area of the British Isles is approximately the same as the State of New Mex-

ico. The country is served with a network of improved highways, it being questionable if there is any other country that compares with England in the uniform character of its highways.

France for the first time in history has accurate statistics on its motor population, and the following figures are as of July 1, 1921: On that date there were 236,146 automobiles of all kinds, which included cars, trucks, and buses, but did not include cyclecars, motorcycles with side cars, or motorcycles. This total gives one motor vehicle for every 152 of population. It represents an increase of 100 per cent as compared with the vehicles in France prior to the war. A further analysis of this total is:

Private cars	135,266
Private trucks	72,649
Motor buses	21,038
Municipal trucks	6,418
State subsidy trucks	777

These figures do not take into account army automobiles of any character.

The division of motor vehicles in France in the different departments shows that by far the greatest number is in the Paris zone. Paris with its suburbs has the following vehicles:

Private cars	22,665
Private trucks	17,482
Buses	16,397

The other French departments are a long distance behind Paris in the registration of motor vehicles. The department of Rhone, which includes the city of Marseilles, has only 8657. The Nord, comprising one of the wealthiest regions of France, has but the same number. An analysis of French registration shows that in many of the agricultural regions a large amount of work remains to be done in selling automobiles.

Germany had registered on July 1, 1921, motor vehicles to a total of 91,678, this including cars, trucks, buses, and tractors, and army vehicles as well as civilian vehicles. A rather complete analysis of this total is as follows:

Motor cars	59,588
Trucks	30,424
Buses	1,372
Tractors	292

To this total may be added motorcycles, 26,729. Germany is the only country in its registration dividing its vehicles into internal combustion, steam, and electric classifications. This analysis shows 385 electric passenger vehicles.

French Motor Vehicle Registrations by Departments

DEPARTEMENTS	State Subsidized Trucks and Buses	Public Service Automobiles		Privately Owned Automobiles		Total		
		Buses	Trucks	Pass. Cars	Trucks	Pass. Cars	Trucks	All kinds Automobiles
Ain	10	60	18	790	388	860	406	1,266
Aisne	10	35	34	744	2,750	779	2,784	3,563
Allier	2	143	14	1,313	441	1,458	455	1,913
Alpes (Basses)	12	33	12	163	112	208	124	332
Alpes (Hautes)	12	20	5	103	70	135	75	210
Alpes-Maritimes	12	694	29	1,329	457	2,035	486	2,521
Ardèche	13	78	22	656	250	747	272	1,019
Ardennes	...	34	43	795	613	829	656	1,485
Ariège	13	22	10	271	108	306	118	424
Aube	8	55	28	1,122	480	1,185	508	1,693
Aude	14	52	65	794	339	860	404	1,264
Aveyron	44	66	50	551	276	661	326	987
Bouches-du-Rhône	3	249	418	4,506	3,481	4,758	3,899	8,657
Calvados	...	93	14	1,901	673	1,994	687	2,681
Cantal	20	67	23	319	108	406	131	537
Charente	...	75	37	1,163	360	1,238	397	1,635
Charente Inférieure	...	110	27	1,423	679	1,533	706	2,239
Cher	...	69	9	715	463	784	472	1,256
Corrèze	1	66	24	391	217	458	241	699
Côte d'Or	6	79	25	1,181	725	1,266	750	2,016
Côtes-du-Nord	4	50	15	1,077	398	1,131	413	1,544
Creuse	13	20	9	424	204	457	213	670
Dordogne	17	45	12	1,029	173	1,091	185	1,276
Doubs	19	58	21	955	658	1,032	679	1,711
Drôme	9	66	17	1,297	339	1,372	356	1,728
Eure	4	122	39	2,198	813	2,324	852	3,176
Eure-et-Loir	...	68	8	1,702	494	1,770	502	2,272
Finistère	12	167	32	1,068	538	1,247	570	1,817
Gard	2	72	79	1,156	412	1,230	491	1,721
Garonne (Haute)	23	48	7	1,170	323	1,241	330	1,571
Gers	7	30	14	395	296	432	310	742
Gironde	11	168	98	1,375	1,439	1,554	1,537	3,091
Hérault	26	96	37	2,647	835	2,769	872	3,641
Ille-et-Vilaine	...	67	32	1,385	484	1,452	516	1,968
Indre	...	49	1	1,975	299	2,024	300	2,324
Indre-et-Loire	4	315	77	4,982	2,173	5,301	2,250	7,551
Isère	20	116	51	1,433	873	1,569	924	2,943
Jura	2	71	26	654	344	727	370	1,097
Landes	...	45	13	796	139	841	152	993
Loir-et-Cher	...	56	22	1,084	491	1,140	513	1,653
Loire	3	96	134	2,971	1,320	3,070	1,454	4,524
Loire (Haute)	...	29	13	239	397	268	410	678
Loire-Inférieure	6	95	45	1,613	710	1,714	746	2,460
Loiret	1	60	25	1,657	459	1,718	484	2,202
Lot	16	38	14	255	70	309	84	393
Lot-et-Garonne	9	34	6	877	330	920	336	1,256
Lozère	5	16	4	79	24	100	28	128
Maine-et-Loire	1	119	7	2,037	712	2,157	719	2,876
Manche	5	96	19	1,051	475	1,152	494	1,646
Marne	...	149	83	1,503	876	1,652	959	2,611
Marne (Haute)	10	17	6	735	430	762	436	1,198
Mayenne	2	75	21	1,006	285	1,083	306	1,389
Meurthe-et-Moselle	...	127	81	1,195	837	1,322	918	2,240
Meuse	...	42	2	1,112	348	1,154	350	1,504
Morbihan	2	38	3	772	291	812	294	1,106
Nièvre	7	126	30	1,079	404	1,212	434	1,646
Nord	2	158	63	4,848	3,345	5,008	3,408	8,416
Oise	...	.....	.....	2,192	1,094	2,192	1,094	3,286
Orne	5	84	14	1,251	439	1,340	453	1,793
Pas-de-Calais	...	165	90	2,018	1,235	2,183	1,325	3,508
Puy-de-Dôme	37	69	21	899	597	1,005	618	1,623
Pyrénées (Basses)	1	279	25	1,302	288	1,582	313	1,895
Pyrénées (Hautes)	7	24	5	275	95	306	100	406
Pyrénées (Orientales)	5	50	32	616	494	671	226	897
Rhône	4	176	366	3,872	2,656	1,052	3,022	7,074
Saône (Haute)	...	38	7	1,050	471	4,088	478	1,566
Saône-et-Loire	4	112	59	1,739	762	1,855	821	2,676
Sarthe	...	55	8	1,482	556	1,537	564	2,101
Savoie	8	19	10	437	232	464	242	706
Savoie (Haute)	14	94	14	468	275	576	289	865
Seine	222	13,395	2,780	22,665	17,482	26,282	20,262	56,544
Seine Inférieure	...	274	128	4,869	1,890	5,143	2,018	7,161
Seine-et-Marne	6	79	28	2,260	985	2,345	1,013	3,358
Seine-et-Oise	17	156	117	3,578	2,555	3,751	2,672	6,423
Deux-Sèvres	...	65	11	1,006	447	1,071	458	1,529
Somme	...	132	461	2,074	990	2,206	1,451	3,657
Tarn	1	60	23	995	253	1,056	276	1,332
Tarn-et-Garonne	5	36	6	413	152	454	158	612
Var	9	75	32	797	338	881	370	1,251
Vaucluse	12	114	30	1,393	380	1,519	410	1,929
Vendée	..	72	10	1,066	288	1,138	298	1,436
Vienne	1	30	4	1,063	374	1,094	378	1,472
Vienne (Haute)	...	53	29	931	471	984	500	1,484
Vosges	4	110	16	1.212	611	1,326	627	1,953
Yonne	3	78	19	1,282	520	1,363	539	1,902
Total	777	21,038	6,418	135,266	72,649	157,081	79,067	236,148

Classification of the 30,424 trucks shows 858 electrics and 30 steam. A classification of the private cars shows:

Privately owned	48,963
Government owned	3,321
Taxicabs	7,574

The 292 tractors are made up of electric, 73; steam, 84, and internal combustion engine, 135. There are 540 fire department vehicles registered, and 264 street cleaning vehicles.

A comparison of the passenger cars registered in Germany on Jan. 1, 1914, and February, 1920, shows a heavy decrease. The figures for 1914 were 60,876, and for February, 1920, 32,450. A comparison of the truck registrations on those dates showed in 1914, 9639, and in 1920, more than double that number, namely, 19,742. The registration of motorcycles in 1914 was 22,557, and in 1920, 9369.

Holland, with an area one-half greater than Massachusetts, and a population close to 7,000,000, has an estimated motor vehicle census of 13,000 motor cars, 500 trucks, 15,000 motorcycles, and 100 tractors. This estimate is as of July 1. It has been impossible to get accurate figures, and even the figures of 1920 to which could be added the imports of 1921, are not correct in that we do not know how many of the vehicles imported remain in the country and how many are merely in transit, destined to other countries. The imports for 1920 totals 7603 vehicles from the following countries:

Country	Number
Germany	3,790
United States	2,968
Belgium	402
France	236
Great Britain	207
Total	7,603

Spain on July 1, 1921, had 37,560 motor vehicles of all kinds in operation. Unfortunately these figures do not show the division between cars and trucks. This total is made up from official figures from the different provinces of Spain showing the widespread distribution of the motor vehicle in that country. As in most European countries, a pretty heavy percentage of the vehicles are in the large cities; thus Madrid, the capital, and Barcelona, a great manufacturing city, each with a population of 650,000, have 7500 cars and trucks each. A total of 37,560 is a small motor vehicle population for a country like Spain, which is one-fifth larger than California in area, and a little larger than all of Germany. Being largely an agricultural area, the prospects for a wide use of vehicles among the agricultural classes is good. Its population is 20,500,000. Ford has established an assembly branch at Cadiz.

Czecho-Slovakia has a total motor population of 4133, which is divided among the city of Prague and the four provinces comprising Czecho-Slovakia as follows:

	Cars	Trucks
Bohemia	1,297	532
Prague	1,121	360
Moravia	326	131
Silesia	97	38
Slovakia	174	57

During 1921 there were sold up to September 1 a total of 555 automobiles. No sales statistics for the remainder of the country for this year are available.

Austrian Conditions

Austria has been designated as the head without the body, remnant of former Austria-Hungary. Vienna, a city of 1,800,000, and one of the beautiful cities of the world, and the former center of Austria-Hungary, is now the major part of what is left of this former empire. Austria is to-day an area scarcely the size of Indiana. It is a great city with a tourist country but none of the manufacturing and agricultural areas to support it, which did support it previous to the war. Notwithstanding that the body, which, so to speak, supported the head, has been amputated, the city of Vienna remains a great city, and one to which the Near East comes to make its purchases. Vienna will have to buy largely her manufacturing and agricultural products from the adjoining countries. The motor population of present Austria, with 6,000,000 people, is approximately 16,350 cars and trucks. These are divided, cars, 13,000; trucks, 3500. To this can be added 4000 motorcycles. The number of motor vehicles in a resort area such as Austria is certain to exceed, by some quantity, the numbers registered by its citizens.

Swiss Registration

Statistics on the number of motor vehicles in Switzerland, the great resort area of Europe, are no indication of the number of motor vehicles in use in the country at certain seasons. This country, which in area is twice the size of Massachusetts, and with 4,000,000 population, had on Aug. 31, 1921, a total car and truck registration of 18,011. The segregated registration figures as of that date are:

Cars	13,172	Motorcycles	9,500
Trucks	4,839	Tractors	160

These figures give Switzerland a motor vehicle, that is, a car or truck for every 200 population. Included in the passenger car figures are 196 passenger buses registered.

Registrations for Italy during 1921 have not been obtainable, but registrations at the close of 1920 showed a total of 53,000 cars, trucks and motor buses. To this should be added 15,000 motorcycles. The detailed figures are:

Cars	25,000	Motorcycles	15,000
Trucks	25,000	Motorbuses	3,000

Estimates on the sales in Italy during 1921 have been placed as follows: Trucks 5000; motorcycles, 5000. No estimate has been obtainable on the number of cars sold last year. Italy as a country in area is twice that of Iowa, and its population of 40,000,000 is twenty times as great as that of Iowa.

Poland on the new map of Europe almost equals California in area, and with its population of 24,000,000 offers one of the fields worth watching and developing for motor vehicles in Europe. The total number of vehicles in use is a composite estimate, and is placed at 10,700, composed as follows: Cars, 6800; trucks, 2000; motorcycles, 1900. A goodly percentage of these are found in the three important cities, Warsaw, Lodz and Posen. Warsaw, with almost a million population, has 2600 vehicles that have been operated during the past year; Lodz, a city of half the size, has 200; and Posen, with 150,000 population, has 300 vehicles. Poland, being largely an agricultural country, is certain when conditions become settled to be a useful market.

There are approximately 980 cars, 120 trucks, and 210 motorcycles in the Free City of Danzig, many of which have been brought in during the past year by the various missions, commissions, Polish officials, and representatives of the League of Nations. In 1920 there were registered in the city 302 cars and 62 trucks, a total of 364. Toward the end of 1921 there were registered cars, 683; trucks, 123; motorcycles, 115.

Bulgaria, whose railroad and other methods of transportation was seriously wrecked during the war, is still as badly handicapped in transportation as practically any country in Europe. For an area as large as Tennessee,

and with 5,000,000 population, the number of cars and trucks, 1140, is hopelessly inadequate. The best available figures obtained from Sofia, the capital, are: Cars, 700; trucks, 400; buses, 40; motorcycles, 100. These figures apply to the entire country. In the past two years the number of motor vehicles has increased 35 per cent, largely by importations of Italian makes. During the war German vehicles were purchased. The present condition of roads in Bulgaria is not conducive to increased use of vehicles, but the inefficient condition of the railroads and the greatly increased production in agriculture, timber and tobacco, augur favorably for an increased use of motor vehicles.

Belgium at the end of 1921 had 33,200 motor cars, trucks, and tractors, according to Government officials as of that date. It might be more conservative to say that there were really in use in Belgium 32,000 vehicles in order to take care of dual registrations. The detailed figures are:

Cars .....28,160 Trucks 3,840

The number of motorcycles in use is 20,000, compared with 11,000 in 1914, immediately previous to the war. The growth of automobiles since 1914 has been nearly 100 per cent. There were, when the war opened, 16,000 automobiles, as compared with 28,160 to-day. Belgium is a small country, only one-half larger than Massachusetts in area and with a population of 7,600,000, and has approximately one automobile for every 230 population.

In considering ratio of population to automobiles, it must be kept in mind that Belgium is a manufacturing country rather than an agricultural one.

Roumania, one of the Balkan countries, which in area equals New Mexico, with 17,000,000 population, has an estimated total of 8500 vehicles of all classes. The Roumanian army operates 1500 vehicles in all parts of the country, the majority of which are in Bucharest, the capital, a city of 350,000 population. In this city are 1960 privately owned vehicles, thus leaving 5100 vehicles of all classes in the remainder of the country. The imports in 1920 were 711 vehicles of all classes. Due to the breaking up of many of the large estates among small land owners, it is not expected that for some time the development of the farm tractor industry will be very rapid.

Portugal, about the size of Indiana, but with nearly 6,000,000 population, had in 1919 about 4400 cars and trucks. To this may be added 200 motorcycles.

Asia

ASIA has a total of 134,730 cars and trucks. More than half of these are located in three countries—India, Japan, and the Dutch East Indies. Despite its enormous population, China stands fourth in the list of registrations. There are many parts of Asia which offer little immediate chance for automotive development.

India	45,983	Federated Malay States	8,000	Siam	2,187
Dutch East Indies	45,000	Turkey	5,500		
Japan	12,260	Ceylon	5,350	Total	134,730
China	8,150	Indo-China	2,300		

China, with its 400,000,000 population and area nearly one-half greater than that of the United States, has a total motor registration of 8150 vehicles, made up as follows: Cars, 6866; trucks, 437; buses, 55; trailers, 50; motorcycles, 792. There is no other country in which greater difficulty lies in the way of accurate registrations than in China. There are several areas that are under the government of other nations, and motor vehicle registrations in such areas are under these respective governments. The most of the vehicles are in the cities. It is estimated that there are 4000 in Shanghai.

China has 60,000 miles of well-constructed courier roads which radiate out of the chief centers and connect with provincial capitals, but unfortunately the use of the telegraph and railroad have let these highways go into disuse. Of these 10,000 miles radiate from the national capital and 50,000 from provincial capitals. China has total railroad mileage of 7000 miles.

The passenger cars and trucks in some of the divisions of China are:

City	Number	City	Number
Canton	152	Changchun	41
Changsha	3	Dairien	240
Foo Chaw	17	Hankow	252
Hongkong	617	Kalgan	35
Mukden	81	Nanking	53
Nantungchow	23	Newchwang	9
Peking	1,127	Shanghai	4,670
Tientsin	646	Tsinan	41
Tsingtao	45	Elsewhere	70

British India, on March 31, 1921, had registered 45,983 motor vehicles, of which the division among cars, motorcycles and trucks follows: Cars, 31,934; motorcycles, 11,399; trucks, 2660. These figures cover the fourteen provinces which make up British India. The greater numbers of the cars are located in the larger cities, and immediate provinces. Bombay has 10,288 cars; Calcutta, 7650, and Madras, 5595. The number of motor trucks in these cities is relatively few: Bombay, 544; Calcutta, 600, and Madras, 59. In the Rangoon province there are 5000 cars and trucks.

The total vehicles in the different provinces of India are:

Province	Number	Province	Number
Bengal	9,757	Bombay	13,290
Burma	5,018	Delhi	603
Madras	3,527	Karachi	899
Central Province	1,170	United Provinces	4,590
Northwest Province	481	Bihar	1,829
Punjab	3,975	Assam	772
Ajmer-Merwara	72		

There were 12,260 automobiles and motor trucks in the Japanese Empire about the middle of 1921, and of this number approximately 7000 were in the city of Tokyo. Roads in Japan are very poor and have restricted the sale of motor vehicles. In spite of this the total of 12,260 scarcely represents the exact number, as many parts are imported into Japan and assembled there. During 1920 there were imported 1745 automobiles valued at $2,425,000, and parts to the value of $2,798,000. A number of companies are building automobiles in small production in different parts of Japan, but the manufacturer is scarcely out of the experimental stage. The building of automobile bodies has developed to a much greater extent.

Ceylon, a British insular possession off the southern end of India, and noted for its exports of tea, spices, rubber, etc., is a good motor car center because of its system of highways, embracing 4000 miles of well surfaced main roads and 4200 miles of minor roads. The island is about the same size as the State of Maine and its population of 4,500,000 equals that of Iowa. On July 1, 1921, its total motor population was 5350 vehicles, made up as follows:

Cars	3,200	Trucks	200
Motorcycles	1,850	Buses	100

During the first five months of 1921 only 394 vehicles were imported. The European population, all British, is approximately 7000. The purchasing power of the natives is low.

The Federated Malay States, with Singapore as capitol, has approximately 8,000 motor cars, of which nearly 4,000 are in Singapore, the most attractive city of that portion of the Orient, and located on an island approximately 30 miles in length and 14 miles wide. The wealth of the Federated Malay States is due to rubber and tin, perhaps 80 per cent of the world's crude rubber coming from this area.

The Dutch East Indies composed of the Islands of Java, Sumatra, Celebes, and other islands, is one of the large motor fields of the east, and it is estimated there are 45,000 motor vehicles in this group of islands, which have been developed by the Dutch. Java, an island 700 miles in length, and 100 miles in width, has literally a net work of good macadam roads, which carry the motorist everywhere. Road building on the other islands has not progressed. With its population of 35,000,000, Java gives promise of being one of the best centers for motor vehicles. Its industries are sugar, coffee, tea, rubber and spices. The Island of Sumatra has some of the largest rubber plantations of the east. Petroleum is a product of Borneo and Sumatra.

Siam, while having a population of 9,000,000 has little more than 2,187 motor vehicles, most of which are in Bangkok, the capital. This total is made up of cars, 1,483; motorcycles, 541; and trucks, 163. While there are approximately 300 miles of good highways in the vicinity of Bangkok the automobiles are mostly in the hands of Chinese merchants and Siamese nobles and officials. A few months ago motor car dealers in Bangkok had a fairly heavy supply of unsold cars on hand. There is a very limited demand for motor trucks. The government operates 1,200 miles of railroad. Rice is the big crop but most of this is transported on the rivers, there not being much of a field for the motor truck in this industry.

French Indo-China one year ago had approximately 2,300 motor cars and trucks, of which number not more than 50 are motor trucks. Practically all of these are European cars, the majority being small French types. There are good roads in the vicinity of Saigon, the capital, in fact the country boasts of 5,600 miles of good macadam roads which are kept in a good state of maintenance. The large rice estates are mostly in the hands of the French. This country does not offer special prospects for the American manufacturer.

Arabia with its 5,000,000 population, and its area nearly one-half that of the United States is one of the many poor motor car areas in Asia. With the exception of Aden there is scarcely any other town in Arabia where motor cars are in use, so that the 300 cars in Aden largely represent the motor population of the country. While there are only 100 motorcycles, there exists a fair demand for them. In the vicinity of Aden there are perhaps 20 miles of roadway suitable for motor cars, and in the remainder of Arabia there are no roads.

In no country are statistics more difficult than in Turkey, largely because of the disturbed condition of the country, and its population of 20,000,000 gives no indication of the number of motor vehicles. It is estimated that including army vehicles, there are 5,500 motor vehicles in the country. These may be divided up as follows: Constantinople has 1,800 of which 1,500 are cars and 300 trucks. In the remainder of Turkey there are 800 cars and 400 trucks, estimated. To this should be added 2,500 army vehicles, giving a total of 5,500. The motorcycle has made very little progress. The estimate for the country being 100. The armies of occupation have sold quite a number of cars and trucks to the public.

Syria, with its 4,000,000 people has not more than 1,500 motor vehicles, practically all of which are in such cities as Damascus, Beirut, and Aleppo. All of these were brought into the country after the fall of 1919. In the Damascus area there are not more than 50 motor cars, most of which are of American manufacture. At Beirut, which is 75 miles from Damascus there are 950 cars and 25 trucks. Aleppo has 65 motor cars and a few trucks.

In several Asiastic countries it is impossible to get any estimate on the motor vehicles in use and it is questionable if there are a score of vehicles in some of these countries. In this list are included Tibet, north of India with 2,000,000 population; Turkestan in the Caspian Sea area, with 2,500,000 population; Afghanistan 6,000,000 population; Baluchistan 1,000,000 and Persia with 10,000,000. There are many army vehicles in Persia, the British government having built military roads of over 600 miles in length leading to Teheran, the capital. The condition of the country makes purchasing almost impossible.

Oceania

IN this group have been included Australia, New Zealand, Hawaii, and the Philippine Islands. Australia and New Zealand have always been of interest to American automotive exporters. The registration for this group is 125,281, Australia alone having 59 per cent of the total number.

Australia	73,900	New Zealand	37,500	Philippine Islands	12,381	Hawaii	1,500

Total 125,281

Australia and New Zealand have a total of 111,400 cars and trucks divided as follows:

	Cars	Trucks
Australia	70,000	3,900
New Zealand	35,000	2,500
	105,000	6,400

To these figures may be added 25,000 motorcycles in New Zealand. the number in Australia not being known.

Australia with an area equalling that of the United States or Canada or Brazil or Europe, has 5,000,000 population, nearly all being white. The Commonwealth of Australia is divided into seven states with a motor population as follows:

	Cars	Trucks	Motorcycles
New South Wales....	25,000	2,502	10,609
Victoria	19,000	.....	11,985
Queensland	11,000	700	2,000
S. Australia	11,004	695	7,504
W. Australia	2,600	505	1,774
Tasmania	2,500	79	1,700

The Island of New Zealand, constituting some of the most fertile agricultural areas of the world have a very creditable motor population:

Cars	25,000
Trucks	2,500
Motorcycles	25,000
Car sales 1921	2,500
Truck sales 1921	250
Car sales 1920	10,000
Truck sales 1920	1,000

Figures on the Philippine Islands on December 31, 1920, gave a total of 12,381 cars and trucks registered. Of this number 9,692 being cars, and 2,689 trucks. The last registration figures from the Director of Public Works, as of Aug. 12, 1921, showed only 11,653 vehicles registered, or a decline on the previous year, largely due to a number of vehicles not having been registered because of the condition of the times. On Aug. 12, the figures of registration were: Cars 9,134; trucks 2,519. These figures will not include army vehicles. The development of highways through the Philippines will stimulate the sale of motor vehicles.

Africa

THE total of 55,583 cars and trucks in the continent of Africa scarcely represents all of the motor vehicles there, although most of the important countries are included. Abyssinia has been left out, however, as well as many areas in the Soudan. The Union of South Africa leads all the other African countries with practically half of the total number of motor vehicles on the continent. The other British possessions, including Egypt, and the French areas of Morocco, Algeria, etc., contain the great majority of cars and trucks.

Union of South Africa....	26,468	Mauritius Island.....	1,600	Madeira Islands.....	100
Algeria	12,000	Canary Islands.....	881	Italian Somaliland.....	66
Egypt	5,084	British West Africa.....	566	Reunion Island.....	35
Gold Coast.....	3,500	Angola	250	Monrovia	3
Morocco	2,500	French West Africa.....	230		
Tunis	1,990	Portuguese East Africa..	400	Total.....	55,832
		Madagascar	159		

The Union of South Africa at the end of 1920 had 25,084 motor vehicles, made up of cars and trucks, and to arrive at a rational estimate of the number in the Union at the end of 1921 we must add 1438 vehicles imported in the first nine months of the year. This gives a total of 26,468 cars and trucks. An analysis shows the following classification of these vehicles:

Passenger cars	22,957
Taxicabs	1,107
Buses	115
Motor trucks	682
Motor delivery vehicles	223
	25,084

An analysis of the 1438 vehicles imported in the first nine months of 1921 shows the great majority from the U. S. A. and Canada. Here are the figures:

U. S. A.	658	France	20
Canada	608	Belgium	10
United Kingdom	114	Italy	4
Germany	23	Holland	1

The heavy imports from Canada are doubtless made up of Fords, and from those other Canadian factories, representing General Motors group, Studebaker, etc.

Egypt, in area over one-half greater than Texas, with 12,000,000 population, or one-third more than New York State, had a total of 5084 cars, buses, trucks, and motorcycles on January 1, a year ago.

An analysis of the 630 vehicles imported in the first eight months of 1921 shows United States, Italy, and France the leading nations in furnishing cars:

U. S. A.	174	Holland	44
Italy	148	Belgium	8
France	130	Switzerland	2
United Kingdom	69	Austria	1
Germany	52	Elsewhere	2

Egypt is sadly lacking in roads, and with the exception of a usable road between Alexandria and Cairo, the vehicles are used only in cities and suburbs. Cairo is a city of 800,000 and Alexandria 450,000 population. Of the 4337 vehicles in use Jan. 1, 1921, almost 3000 were in Cairo. In Alexandria there were in use 1024 automobiles, 150 taxis, 203 motorcycles and 67 motor trucks.

Algeria, about the size of the State of Kansas and with 5,500,000 population, is largely dominated by French automobiles and motor trucks, chiefly because it is a French colony and only thirty hours by boat from France. In Algeria are 12,000 motor vehicles, of which 741 were imported in the first six months of 1921. Imports in other years were:

1919 ..... 595 1920 3,360

Motor vehicles from France enter free of duty. Railroad mileage is very limited, and the use of motor trucks between seaports and inland cities has developed rapidly, France taking the lead in this field. Many excellent vehicle roads exist and the use of motor buses has been a recent development in inter-city travel.

Since the Armistice fortunes made during the war by business men and wine growers were generally used to purchase motor cars. Motorcyles are used very little, as distances are generally too great for their effective use.

There are 2800 miles of improved highways.

An analysis of cars in Algeria in 1920 showed thirty different makes of French cars and nine makes of United States, totaling 1580.

Morocco, a French protectorate in North Africa bordering on the Mediterranean, is a little smaller than Texas, and with 6,000,000 population has not over 2500 motor vehicles. The country has 2000 miles of improved roads, and has a few narrow gage military railroads that are not very useful for commerce. It is an agricultural area that should use a goodly quota of trucks, but only 272 were in use July, 1921, this not including army vehicles. American automobiles have a good hold in Morocco, with French machines holding the majority. In Morocco is

what is known as the International Zone of Tangier, an area of 140 square miles, with 75 passenger automobiles.

Tunis, equal in area to Wisconsin and with 2,000,000 population, borders on the Mediterranean, and on June 30, 1921, had 1990 cars and trucks. To this can be added 600 farm tractors and 246 motorcycles. An automobile summary of Tunisia is:

Cars	1,803	Motorcycles	246
Trucks	187	Tractors	600

The Gold Coast Colony, a British possession, has 3500 motor vehicles of all types in use, to which can be added 240 used by the Government, about 60 cars, 4 buses, 20 mail trucks and 160 trucks. Two or three farm tractors are being used by the agricultural department of the Government.

In the Province of Cameroon only 4 motorcycles are in use and no cars or trucks.

In Angola, an estimate by the United States consul places the motor population at 250 cars, trucks, motorcycles, and tractors. In all of Belgian Congo there are not over 200 motor vehicles.

The Republic of Monrovia, the only republic in Africa. has 3 motor vehicles, two Fords and a Reo, according to the United States consul. The republic lacks roads.

French West Africa has 150 cars, 80 trucks and 15 motorcycles, these being in Senegal, Ivory Coast, Upper Senegal, and Niger.

British West Africa has vehicles as follows: Gambia, 60; Sierra Leone, 65; and Nigeria, 441.

The Canary Islands, with 500,000 population and 372 miles of crushed stone roads, has 720 cars, 161 trucks, and 40 motorcycles, a total of 921 vehicles. In 1914 there were 185 cars on the seven islands. As there are no railroads on the islands, travel is largely by car and motor bus, the latter seating twenty to thirty passengers. Fruits and other agricultural products are largely transported to seaport by motor truck.

Madeira Islands imported 15 cars in 1920 and 4 in 1919. Motorcycles have grown in popularity in the last two years and there are 100 on the islands.

Africa's largest island, Madagascar, is nearly as large as Texas, is as long as from New York to Chicago, and, with a little over 2,000,000 people, largely natives, has 1300 miles of macadam roads, 400 miles of other good roads, and 130 miles of macadam streets in cities and towns. Madagascar is a French possession and French motor vehicles are favored by the Government. The railroad mileage is very limited, not over 450 miles of track being built. There are 132 cars and 27 trucks in use in the island, and of these the Government operates 53 cars, 12 trucks, 17 buses for mail and passenger service. In Tananarine, the capital, 103 of the cars are used. Of the 159 cars in use 116 are French and 38 United States. Three farm tractors are in use.

Portuguese East Africa, or the Province of Mozambique, has 400 motor vehicles, of which a majority are in the city of Lourenco Marques. The three farm tractors in the Province are being used for demonstration purposes. In 1920 there were 68 cars imported, of which 40 came from America. In the same year 46 motorcycles were imported, 11 coming from the United States. Lourenco Marques has 50 miles of paved streets, some leading to the suburbs. A fairly good road leads from the city to Goba, 54 miles.

Italian Somaliland has 16 cars, 50 motor trucks, 4 motorcycles and 18 tractors. Most of these vehicles are in and around Magadozo.

The island of Mauritius, with an area of 720 square miles and 365,000 population, mostly Indians, has 1600 automobiles.

The island of Reunion has 35 automobiles and a population of 175,000, according to the United States consul at Tananarivo.

Palestine, the cradle of Christianity, which passed from the control of Mohammed to Christianity in the final year of the great war, has 536 cars and trucks. To be accurate, the United States consul reports 494 cars, 42 trucks and 83 motorcycles. With the occupation of the British Army the old Turkish roads were converted into motoring highways, and now this historic land, no larger than the State of Maryland, and with a population of 647,000, has 500 miles of first class motor roads. To this add 1500 miles of second class roads that can be used by motor cars at favorable seasons. You can motor from Jerusalem to Damascus. The motor statistics given do not include army vehicles.

In certain instances it has been impossible to obtain acceptable data concerning car and truck registrations. The following list of countries is appended in the hope that some reader may be able to give us additional information regarding them. The list is as follows:

Iceland, Jugoslavia, Latvia, Lithuania, Esthonia, Armenia, Abyssinia, Alaska, Liberia, Hedjaz, Ukrania.

South Africa Offers Market for Tires

WITH the increasing imports of motor cars and motor cycles into the Union of South Africa there has been a corresponding demand for tires, according to a report to the Department of Commerce by Trade Commissioner Stevenson at Johannesburg. As with most other lines, imports of tires during 1920 can not be taken as a true indication of the market's normal purchasing power, as prices were inflated and the volume of imports exceeded the demand. In 1920, however, American tires predominated for the first time, with £517,692 ($2,578,460), as against British imports valued at £464,008 ($2,320,040), French at £145,096 ($725,480), and Canadian at £117,844 ($589,220).

The import figures for the first eight months of 1921 do not give separate statistics for tires, but, judging from the fact that in previous years tires have been about 80 to 90 per cent of the total under the classification of "India rubber, raw and manufactures of," 85 per cent of the total of £192,705, or £163,800, may be approximately reckoned as tires. The total value for the first eight months of 1920 was £982,184, of which about £831,850 represents tires. It is only natural that tire imports should react from the record figures of 1920. Stocks and deliveries were very heavy in 1920, which curtailed new imports during the early part of 1921. At the present time the situation in South Africa has been largely righted and the demand for tires is fairly good, although there is considerable room for improvement. At this time stocks in the country have been appreciably reduced. While in the early part of 1921 stocks were often estimated as sufficient for a year or eighteen months, to-day many firms are short of the better lessing lines.

As to sales methods employed the large American companies work on the same general lines as in the United States. Service has been the keynote of their policies. Stocks have been carried in the country; expensive advertising campaigns have been carried out; and technical and sales help given to the dealers.

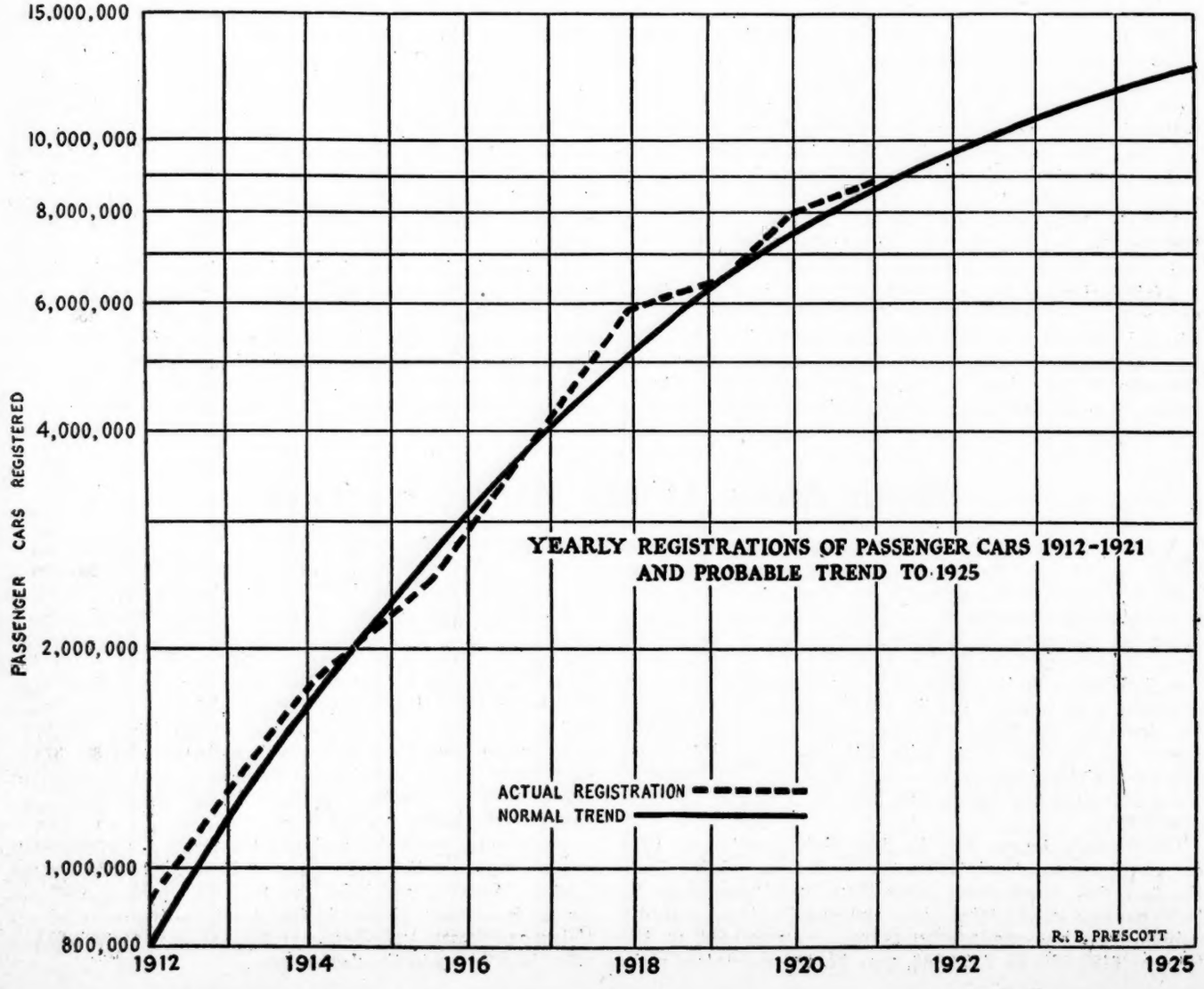
Revised Figures Show U. S. Car and Truck Registration of 10,505,660

Gain of 1,573,202 recorded over 1920. Increase of 17.6 per cent. One motor vehicle for every 10.2 persons in the United States. Total fees amount to $122,038,613. Motorcycle registrations drop 27,024. Grain state registrations increase despite year of general agricultural depression.

FINAL revised figures show that there were 10,505,660 cars and trucks registered in the United States during 1921. This is an actual gain of 1,573,202 over 1920; a percentage gain of 17.6 per cent. There is now one car for every 10.2 persons in the country; $122,038,613 in fees were collected from car owners.

It should be noted at once that a little over 200,000 of this gain in registration is merely an apparent statistical gain, due to the fact that proper figures for the State of Minnesota and for the District of Columbia are now available for the first time. Even though this is the case, however, the gain for 1921 equals that of 1920, a distinctly encouraging result in view of the depressed condition of business during the last year.

Since motor vehicles have come to be used so largely for utility purposes it is interesting to discuss the registration figures in relation to the various industrial activities of the several states. For this purpose an arbitrary division may be made as follows, a State being classified according to the type of industrial activity which predominates within its borders:



1—Manufacturing States:
Massachusetts, New York, Pennsylvania, Michigan, Indiana, Delaware, Connecticut, Rhode Island, New Jersey and Wisconsin.

2—Agricultural States:
Arkansas, North Dakota, South Dakota, Kansas, Minnesota, Nebraska, Oregon, Oklahoma, Texas, Washington and Iowa.

3—Mining States:
Wyoming, Nevada, Utah, Montana, Colorado, Arizona, Idaho and New Mexico.

4—Southern States:
Florida, Georgia, Virginia, North Carolina, South Carolina, Kentucky, Tennessee, Louisiana, Mississippi, Alabama, West Virginia.

The population and registration of these four groups line up in this way:

Group	Population	Registration
Manufacturing	38,350,503	3,568,462
Agricultural	20,100,362	2,591,205
Mining	3,445,116	400,531
Southern	22,902,405	1,175,281

It may be noted here that the population figures used in making the calculations throughout this article are those estimated by the Federal Bureau of Census for July 1, 1921. Using these as a basis, it appears that the agricultural states have the most dense automobile population, followed by the mining, manufacturing and southern groups in the order named. This order is the same as last year, but a comparison of the persons per car in these groups in 1920 and 1921 shows one or two interesting features. The figures for these two years are as follows:

Group	Persons Per Motor Vehicle 1920	1921
Agricultural States	8.10	7.76
Mining States	8.90	8.61
Manufacturing States	12.00	10.72
Southern States	20.08	19.50

This comparison indicates that the potential development possibilities of the group of southern states has not been realized to any great extent during the past year. This is true despite the fact that a large percentage of the population in these states is colored and that a large percentage of the colored population does not comprise a market.

Registration of Motor Vehicles

State	Total Net Registration	Non-Resident Registrations and Transfers	Passenger Cars	Commercial Cars	Motorcycles	Total Fees
Alabama	82,343	.....	73,233	9,110	805	$1,147,265
Arizona	35,049	.....	31,069	3,980	440	195,970
Arkansas	67,446	509	66,480	966	192	678,984
California	673,830	202,562	638,922	34,908	17,603	6,790,981
Colorado	145,739	.....	136,336	9,403	2,868	906,059
Connecticut	137,526	.....	110,316	27,210	5,589	2,033,838
Delaware	21,413	.....	.....	.....	541	375,469
District of Columbia	71 645	.....	54,147	6,976	2,487	383,289
Florida	97,837	.....	82,992	14,845	1,296	750,000
Georgia	131,942	2,511	.....	.....	1,338	1,703,913
Idaho	51,294	930	46,935	4,359	744	843,951
Illinois	670,434	.....	590,527	79,907	7,104	6,803,456
Indiana	400,342	.....	357,025	43,317	7,524	2,422,171
Iowa	460,528	99	430,003	30,525	3,897	7,718,926
Kansas	291,309	4,205	269,661	21,648	2,271	3,000,000
Kentucky	126,371	.....	111,227	15,144	1,185	1,771,887
Louisiana	80,500	.....	70,000	10,500	498	453,276
Maine	77,527	7,241	67,591	9,936	1,525	1,004,914
Maryland	140,572	.....	128,042	12,530	7,847	2,460,162
Massachusetts	360,732	44,000	305,471	55,261	12,048	4,717,389
Michigan	477,037	.....	426,984	50,053	6,195	6,751,925
Minnesota	328,700	.....	301,900	26,800	3,500	5,616,114
Mississippi	65,139	.....	58,429	6,710	375	537,462
Missouri	346,437	17,850	.....	.....	3,609	2,505,354
Montana	58,785	650	.....	.....	472	594,521
Nebraska	238,704	.....	219,781	18,923	1,866	2,819,629
Nevada	10,819	.....	.....	.....	130	102,800
New Hampshire	42,039	8,131	36,994	5,045	2,358	876,322
New Jersey	272,994	52,849	248,477	24,517	9,724	4,106,269
New Mexico	24,703	.....	.....	.....	214	255,000
New York	812,031	.....	630,791	181,240	26,998	10,000,000
North Carolina	148,684	.....	134,884	13,800	1,276	2,250,000
North Dakota	92,644	6,261	90,221	2,423	810	683,052
Ohio	720,632	32,878	622,044	98,588	23,026	6,886,205
Oklahoma	221,300	.....	.....	.....	1,013	2,592,195
Oregon	118,325	.....	103,735	14,590	3,164	2,334,782
Pennsylvania	689,589	75,559	632,541	57,048	21,111	9,460,895
Rhode Island	54,957	7,636	45,059	9,898	1,780	847,083
South Carolina	90,546	1,394	83,349	7,197	756	733,820
South Dakota	119,274	.....	110,997	8,277	682	720,587
Tennessee	117,025	6,309	102,795	14,230	1,043	1,387,374
Texas	467,616	113,809	.....	.....	3,905	2,146,873
Utah	47,523	.....	40,587	6,936	909	441,359
Vermont	36,965	4,495	33,478	3,487	965	668,289
Virginia	141,000	.....	125,000	16,000	2,200	2,100,000
Washington	185,359	12,727	156,693	28,666	3,763	2,925,731
West Virginia	93,894	.....	89,397	4,497	1,539	1,600,000
Wisconsin	341,841	.....	320,577	21,264	6,423	3,644,950
Wyoming	26,619	247	.....	.....	322	288,122
TOTALS	10,505,660	602,852	8,184,690	1,010,714	207,930	$122,038,613

Persons Per Motor Vehicle, Dec. 31, 1921

Iowa	5.28
South Dakota	5.38
Nebraska	5.49
California	5.78
Kansas	6.14
Colorado	6.61
Oregon	6.76
Nevada	7.07
North Dakota	7.09
Dist. of Col.	7.35
Indiana	7.41
Minnesota	7.41
Washington	7.47
Wyoming	7.55
Wisconsin	7.84
Michigan	7.97
Ohio	8.20
Idaho	8.75
Oklahoma	9.09
Utah	9.69
Vermont	9.77
Montana	9.83
Illinois	9.87
Missouri	9.92
Maine	9.95
Arizona	10.10
Maryland	10.21
Texas	10.21
Florida	10.22
Connecticut	10.35
Delaware	10.53
New Hampshire	10.59
Massachusetts	10.89
Rhode Island	11.21
New Jersey	11.94
Pennsylvania	12.90
New York	12.99
New Mexico	14.78
West Virginia	16.04
Virginia	16.68
North Carolina	17.55
South Carolina	18.85
Kentucky	19.23
Tennessee	20.09
Georgia	22.35
Louisiana	22.61
Arkansas	26.39
Mississippi	27.40
Alabama	29.50

Cars and Trucks in the United States December 31, 1921

New York	812,031
Ohio	720,632
Pennsylvania	689,589
California	673,830
Illinois	670,434
Michigan	477,037
Texas	467,616
Iowa	460,528
Indiana	400,342
Massachusetts	360,732
Missouri	346,437
Wisconsin	341,841
Minnesota	328,700
Kansas	291,309
New Jersey	272,994
Nebraska	238,704
Oklahoma	221,300
Washington	185,359
North Carolina	148,684
Colorado	145,739
Virginia	141,000
Maryland	140,572
Connecticut	137,526
Georgia	131,942
Kentucky	126,371
South Dakota	119,274
Oregon	118,325
Tennessee	117,025
Florida	97,837
West Virginia	93,894
North Dakota	92,644
South Carolina	90,546
Alabama	82,343
Louisiana	80,500
Maine	77,527
Arkansas	67,446
Mississippi	65,139
District of Columbia	61,745
Montana	58,785
Rhode Island	54,957
Idaho	51,294
Utah	47,523
New Hampshire	42,039
Vermont	36,965
Arizona	35,049
Wyoming	26,619
New Mexico	24,703
Delaware	21,413
Nevada	10,819
Total	10,505,660

Percentage Gain in Registration Dec. 31, 1920 to Dec. 31, 1921

Florida	32.40
Maine	23.28
Louisiana	22.00
New York	21.35
New Hampshire	21.23
Pennsylvania	20.91
Maryland	20.81
Indiana	20.22
New Jersey	19.92
West Virginia	19.10
Massachusetts	18.47
California	18.41
Illinois	17.91
Delaware	17.11
Ohio	17.10
Vermont	16.84
Missouri	16.71
Wisconsin	16.61
Michigan	15.59
Connecticut	15.41
Tennessee	14.91
Arkansas	14.18
Oregon	14.04
Colorado	13.02
Kentucky	12.12
New Mexico	11.71
Utah	11.58
Wyoming	11.23
Alabama	10.31
Kansas	9.78
Texas	9.35
Rhode Island	9.10
Oklahoma	8.30
Nebraska	7.05
Washington	6.60
North Carolina	5.58
Iowa	5.33
Virginia	5.23
Nevada	3.39
Mississippi	2.62
North Dakota	1.98
Arizona	1.42
Idaho	.83
Losses	
Georgia	8.65
Montana	3.07
South Carolina	2.44
South Dakota	.93

Average gain—17.6 per cent.

It is interesting to note that as regards persons per car the manufacturing states, which in 1920 already had but half as many persons per car as the southern states, reduced their number of persons per car by 1.28 during the past year, while the southern states reduced only .58.

The figures for the great grain-growing states, as well, indicate a healthy condition as regards cars and trucks, despite the fact that the value of the grain crop in 1921 decreased 48 per cent, while the volume decreased only 1½ per cent compared, with the five-year average (1914-1918) production and value.

In the midst of this unfavorable condition registrations increased 75,296 during 1921 in the group of grain states comprising South Dakota, North Dakota, Minnesota and Kansas. In making this calculation the number of cars in Minnesota for 1920 has been estimated at 280,000, since exact figures will never be available. This means that the number of persons per car in this group of states has been reduced during the period of business depression, using the 1920 and 1921 population figures respectively in making the calculation. For these four states the numbers of persons per car were as follows:

1920.....7.23 persons per vehicle
1921.....6.64 persons per vehicle

These figures show a favorable condition from an automotive standpoint when taken in conjunction with the fact that Iowa, the great corn State, showed an increased registration of 23,228. The Iowa figures shown in the preliminary report gave that State a loss in registration for the year, but the final figures indicate the material gain recorded above. This constitutes the only major change from the preliminary compilation, although New York and one or two other states have materially increased totals.

New York Still on Top

New York still leads in total registrations. There is no change, in fact, in the first five states. Iowa, however, has dropped behind Michigan and Texas and now stands eighth instead of sixth.

New York also leads in actual registration gain for the year, while Pennsylvania is also ahead of Ohio, the State which had the largest numerical gain last year. Five states gained more than 100,000 in registrations during 1921. These states were as follows:

New York	142,741
Pennsylvania	119,425
Ohio	105,235
California	104,938
Illinois	101,675

The final figures show registration losses in four states, Georgia having lost 12,480; South Carolina, 2272; Montana, 1861, and South Dakota, 1121. This is the first time that losses have been recorded in any state, but the character of the losses is such as to eliminate a possibility of the assumption that they are due to "saturation" of the states involved.

South Carolina has 18 persons per motor vehicle, Georgia has 22 and Montana about 10. South Dakota has 5.38, but its drop is obviously to be attributed to the peculiarly unfavorable economic position in which that State has been during the last year.

Florida Has Large Percentage Gain

The largest percentage gain in registration was made by Florida, which has 32.40 per cent more motor vehicles

Gain Made in Car and Truck Registration 1920-1921

New York	142,741	New Hampshire	7,359
Pennsylvania	119,425	Virginia	7,000
Ohio	105,235	Vermont	5,340
California	104,938	Utah	4,945
Illinois	101,675	Rhode Island	4,582
Indiana	67,635	Delaware	3,113
Michigan	64,320	Wyoming	2,693
Massachusetts	56,101	New Mexico	2,594
Missouri	49,518	North Dakota	1,804
Wisconsin	48,543	Mississippi	1,655
New Jersey	45,257	Arizona	490
Texas	39,923	Idaho	421
Kansas	25,913	Nevada	355
Maryland	24,231	District of Columbia	52,033
Florida	23,923	Minnesota	263,183
Iowa	23,228		1,590,936
Connecticut	18,392		
Oklahoma	17,000		
Colorado	16,788		
Nebraska	15,704	DECREASES IN CAR AND TRUCK REGISTRATION	
Tennessee	15,173		
West Virginia	15,032	Georgia	12,480
Maine	14,620	South Carolina	2,272
Oregon	14,535	Montana	1,861
Louisiana	14,500	South Dakota	1,121
Kentucky	13,686		17,734
Washington	11,439		
Arkansas	8,364		
North Carolina	7,824	Net Gain	1,573,202
Alabama	7,706		

than last year. Louisiana is the only other southern State that has gained more than 20 per cent. Although it has always lead in total registrations, New York is still to be found near the top of percentage gain. It stands in fourth place this year with a gain of 21.35 per cent, despite its already large gross total.

Idaho has the smallest gain, its increase over 1920 being only .83 per cent. Minnesota and the District of Columbia are not included in the list of percentage gains, because their gains, as noted before, are chiefly statistical rather than actual.

To use the accompanying tables intelligently it is necessary to take into account certain variables which are involved in the registration methods of the various states.

To begin with, there is little possibilty of determining accurately, under present conditions, the division between car and truck registrations. In AUTOMOTIVE INDUSTRIES of Nov. 17 a detailed explanation was given as regards the possibility of getting this segregation accurately. The result of this analysis showed that by extensive research it is possible to get passenger car figures which will be accurate for all practical purposes, involving an error of only about 1 per cent, but that no such accuracy is possible in regard to truck figures, as the error may run anywhere from 25 per cent to 40 per cent. Even such figures cannot be determined merely from the results published by the various states, but must be obtained in most cases by an actual examination and compilation from the registration books.

Many states do not segregate car and truck registrations at all. Even in those cases where they do, however, there is a wide variation in definition of what is a car and what is a truck.

Some states register tractors with trucks and do not register trailers; others register trailers with trucks and do not register tractors; others register both tractors and trailers with trucks, and still others register neither trailers nor tractors in any way. These facts should be borne in mind when any calculations are being made on the basis of apparently segregated registrations.

It is the practice in some states, as well, to classify vehicles on the basis of use rather than construction.

Detailed and useful segregation of motor vehicle registrations is being made in several states at present, notably Oregon, New York and Michigan. But even in these cases the practice is not uniform among the three.

Motor Vehicle Registration 1912 to 1921

	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
Alabama	3,385	5,435	8,078	11,925	21,636	32,873	46,171	58,898	74,637	82,343
Arizona	1,624	3,098	5,040	7,318	12,124	19,890	23,905	28,979	34,559	35,049
Arkansas	2,250	3,000	5,642	8,021	15,000	28,693	41,458	49,450	59,082	67,446
California	88,699	60,000	123,516	163,795	232,440	306,916	364,800	477,450	568,892	673,830
Colorado	8,950	13,135	17,756	27,568	43,296	66,850	83,630	104,865	128,951	145,739
Connecticut	24,101	27,189	33,009	43,985	61,855	85,724	92,605	109,651	119,134	137,526
Delaware	1,732	2,350	3,050	4,657	7,102	10,700	12,955	16,152	18,300	21,413
Dist. of Columbia	1,732	2,373	4,833	8,009	13,118	15,493	30,490	35,400	9,712	61,745
Florida	1,749	2,372	3,368	10,850	20,718	27,000	54,186	55,400	73,914	97,837
Georgia	19,120	18,500	20,916	25,671	47,579	70,357	99,800	127,326	144,422	131,942
Idaho	2,500	2,173	3,346	7,071	12,999	24,731	32,289	42,220	50,873	51,294
Illinois	68,073	94,656	131,140	180,832	248,429	340,292	389,620	478,438	568,759	670,434
Indiana	54,334	47,000	66,400	96,915	139,317	192,192	227,160	277,255	332,707	400,342
Iowa	47,188	75,088	112,134	152,134	198,602	254,317	278,313	363,857	437,300	460,528
Kansas	22,000	34,366	49,374	72,520	112,122	159,343	189,163	227,752	265,396	291,309
Kentucky	5,147	7,210	11,746	19,500	31,700	47,416	65,870	90,641	112,685	126,371
Louisiana	7,000	7,200	12,000	11,380	17,000	28,394	40,000	51,000	66,000	80,500
Maine	7,743	10,570	15,700	21,545	30,972	41,499	40,372	53,425	62,907	77,527
Maryland	10,487	14,254	20,213	31,047	44,245	60,943	74,666	95,634	116,341	140,572
Massachusetts	50,132	62,660	77,246	102,633	136,809	174,274	193,497	247,183	304,631	360,732
Michigan	39,579	54,366	76,389	114,845	160,052	247,006	262,125	325,813	412,717	477,037
Minnesota	29,000	37,800	67,862	93,269	46,000	54,009	204,458	259,743	65,517	328,700
Mississippi	2,895	3,000	5,964	9,669	25,000	36,600	48,400	45,030	63,484	65,139
Missouri	24,379	38,140	54,468	76,462	103,587	147,528	188,040	244,363	296,919	346,437
Montana	2,000	5,686	10,172	14,499	24,440	42,696	51,037	59,325	60,646	58,785
Nebraska	33,861	25,617	40,929	59,140	100,534	148,101	175,409	192,000	223,000	238,704
Nevada	900	1,131	1,487	2,009	4,919	7,160	8,159	9,305	10,464	10,819
New Hampshire	5,764	7,420	9,571	13,499	17,508	22,267	24,817	31,625	34,680	42,039
New Jersey	43,056	48,892	60,247	78,232	104,341	134,964	155,519	190,873	227,737	272,994
New Mexico	911	1,721	2,945	5,100	8,228	8,457	15,000	18,077	22,109	24,703
New York	107,262	134,405	169,966	234,032	317,866	411,567	463,758	571,662	669,290	812,031
North Carolina	6,178	10,000	14,677	21,000	33,904	55,950	72,313	109,017	140,860	148,684
North Dakota	8,997	13,075	15,701	24,908	40,446	62,993	71,627	82,885	90,840	92,644
Ohio	63,066	86,054	122,504	181,332	252,431	346,772	412,775	511,031	615,397	720,632
Oklahoma	6,524	7,934	13,500	25,032	52,718	100,199	121,500	144,500	204,300	221,300
Oregon	10,165	13,957	16,447	23,585	33,917	48,632	63,324	83,332	103,790	118,325
Pennsylvania	59,357	76,178	112,854	160,137	230,578	325,153	394,186	482,117	570,164	689,589
Rhode Island	8,565	10,294	12,331	16,362	21,406	37,046	36,218	44,833	50,375	54,957
South Carolina	10,000	11,500	14,500	15,000	19,000	39,527	55,492	70,143	92,818	90,546
South Dakota	14,481	14,578	20,929	28,784	44,271	67,158	90,521	104,628	120,395	119,274
Tennessee	35,187	54,362	19,769	7,618	30,000	48,000	63,000	80,422	101,852	117,025
Texas	35,187	54,362	64,732	90,000	197,687	213,334	251,118	331,310	427,693	467,616
Utah	2,576	4,021	2,253	9,177	13,507	24,076	32,273	35,236	42,578	47,423
Vermont	4,283	5,918	8,256	11,499	15,671	20,369	22,655	26,807	31,625	36,965
Virginia	5,760	9,022	14,002	21,357	25,426	55,000	72,228	94,120	134,000	141,000
Washington	13,990	24,178	30,253	38,823	60,734	91,337	117,278	148,775	*173,920	185,359
W. Virginia	5,349	5,088	6,159	13,279	20,571	31,300	38,750	50,203	78,862	93,894
Wisconsin	24,578	34,646	53,161	79,791	115,637	164,531	196,844	236,981	293,298	341,841
Wyoming	1,300	1,584	2,428	3,976	7,125	12,523	16,200	21,371	23,926	26,619
Totals	1,033,096	1,287,558	1,768,720	2,479,742	3,584,567	4,992,152	6,105,974	7,596,503	8,932,458	10,505,660

*Estimated.

Motorcycle Registrations 1918-1921

	1918	1919	1920	1921		1918	1919	1920	1921
Ala.	1,180	1,103	1,035	805	N. H.	2,452	2,632	2,542	2,358
Ariz.	685	596	542	440	N. J.	12,517	11,416	11,041	9,724
Ark.	**	**	**	192	N. Mex.	300	200	219	214
Cal.	27,887	28,028	20,047	17,603	N. Y.	28,597	28,561	29,453	26,998
Colo.	3,909	3,636	3,364	2,868	N. C.	1,333*	1,459	1,418	1,276
Conn.	4,246	4,495	6,543	5,589	N. Dak.	1,659	901	898	810
Del.	707	699	674	541	Ohio	20,717	20,444	26,956	23,026
D. C.	2,353	2,412	519	2,487	Okla.	1,622	1,310	1,320	1,013
Fla.	1,629	1,412	1,275	1,296	Ore.	3,501	3,570	3,516	3,164
Ga.	1,681	1,722	1,688	1,338	Pa.	26,621	25,760	23,981	21,111
Idaho	707	731	764	744	R. I.	1,464	2,301	2,225	1,780
Ill.	10,834	10,920	10,597	7,104	S. C.	1,147	869	908	756
Ind.	9,112	8,995	8,823	7,524	S. Dak.	1,323	888	777	682
Iowa	2,529	3,035	4,000*	3,897	Tenn.	800	1,133	1,151	1,043
Kans	4,173	3,589	2,972	2,271	Texas	2,496	3,990	4,293	3,905
Ky.	1,479	1,503	1,543	1,185	Utah	1,298	1,185	1,114	909
La.	399	490*	500	498	Vt.	734	800	946	965
Me.	1,497	1,608	1,566	1,525	Va.	2,414	2,520	2,233	2,200
Md.	5,351	5,872	7,332	7,847	Wash.	6,317	5,050	4,915	3,763
Mass.	12,862	13,698	15,143	12,048	W. Va.	847	994	1,659	1,539
Mich.	7,818	7,875	8,011	6,195	Wis.	7,238	7,223	8,002	6,423
Minn.	5,021	6,389	1,158	3,500	Wyo.	313	353	327	322
Miss.	100*	120*	194	375					
Mo.	3,980	4,131	3,954	3,609	Total	233,665	233,386	234,954	207,930
Mont.	852	847	675	472					
Nebr.	2,900	2,500	2,000	1,866					
Nev.	121	125	141	130					

*Estimated **Not segregated

The industry will never be able to obtain the maximum benefit from registration figures until there is a uniform registration law throughout the country. There are already samples of valuable and sound practice, but such practice is not at all universal. Moreover, uniformity is necessary as well as essential soundness. A detailed outline for the best method of segregating and compiling motor vehicle registrations would be a worthwhile addition to the Uniform Motor Vehicle Law, which many automotive interests throughout the country are now supporting.

The foregoing explanation indicates the reason for compiling a table of persons per motor vehicle rather than two tables of persons per car and persons per truck. It can't be done with any degree of accuracy at the present time. The tables used, however, do give a comparative evaluation from year to year.

In the major table, "total net registration" includes only cars and trucks. It does not include motorcycles.

Motorcycles Drop

Motorcycle registration took a decided fall during 1921, when 27,024 less machines were registered than in 1920. The motorcycle total for 1921 was 207,930, a drop of 11.54 per cent as compared with the previous year.

Persons Per Car

Iowa has taken the lead in having the lowest number of persons per car. Its superiority over South Dakota in this respect, however, is so small as to be almost negligible. Iowa, South Dakota, Nebraska and California, in fact, are all very closely bunched, the difference being extremely slight.

Indiana is the first of the manufacturing states to appear in this list, followed by Wisconsin and Michigan. The first five manufacturing states rank as follows:

Indiana	7.41
Wisconsin	7.84
Michigan	7.97
Ohio	8.20
Illinois	9.87

There are no manufacturing states included in the first ten of this list, nor are there any of the southern states in this charmed circle of ten. There are six agricultural states, two mining states and two—California and District of Columbia—not included in the arbitrary classification used here.

In certain instances this persons per car was higher in 1921 than in 1920. This is due to the fact that the population has increased at a greater rate than has registration during the last year.

Motor Buses Increase in Number

THE motor bus has become a real factor in transportation during the last few years. All the available statistics indicate that the use of buses has increased materially during 1921. This has been true both in the United States and in Great Britain, although in England the bus has taken a greater proportionate part in transportation than it has over here up to the present time.

The best available conservative estimates indicate that there are nearly 1000 motor bus lines in the United States, as against about half that number a year ago. It is difficult to estimate the number of buses actually in operation since no provision for segregated registration of such vehicles is made in the various states. *The Commercial Vehicle* estimates that something over 5000 buses are now in operation, while the N. A. C. C. gives the figure as 20,000. The former figure is a more conservative estimate.

Eight thousand six hundred motor buses are being used in England, according to the best figures available over there. Of this number nearly 50 per cent are being operated in the London area.

No Government figures are available or taken showing the number of such vehicles in use. The existing system of registration in England includes motor buses with all other forms of "hackney carriages," as they are officially described, and these consist of taxicabs, motor coaches, private hire cars, carriers' vehicles licensed to accommodate a proportion of passengers as well as motor buses.

Information was obtained from individual makers of this type of vehicle as to the number of their chassis known to be in use for such a purpose. While admittedly this indirect method cannot give anything but an approximate figure, there is reason to believe it has at least the merit of affording a conservative estimate, for it does not and cannot take into consideration the number of surplus Government trucks the chassis of which have been fitted with bus bodies by their purchasers without the knowledge of the chassis manufacturers. The number of chassis thus applied is, however, not believed to be large; none of the big bus undertakings have used them and those that have been fitted up for public passenger work have been so treated in ones, twos and threes for isolated services in country districts; 500 would probably be a fair estimate of the total in this class of use exclusively.

True, if there are taken into consideration the number of "surplus" truck chassis with public passenger bodies of the motor coach type, the total would probably amount to 2000 or 3000. But these vehicles are not run to time-table or on regular services, being mostly in use only during the summer months on pleasure trips from their headquarters.

Production

Automotive Production Statistics Show Industrial Stability

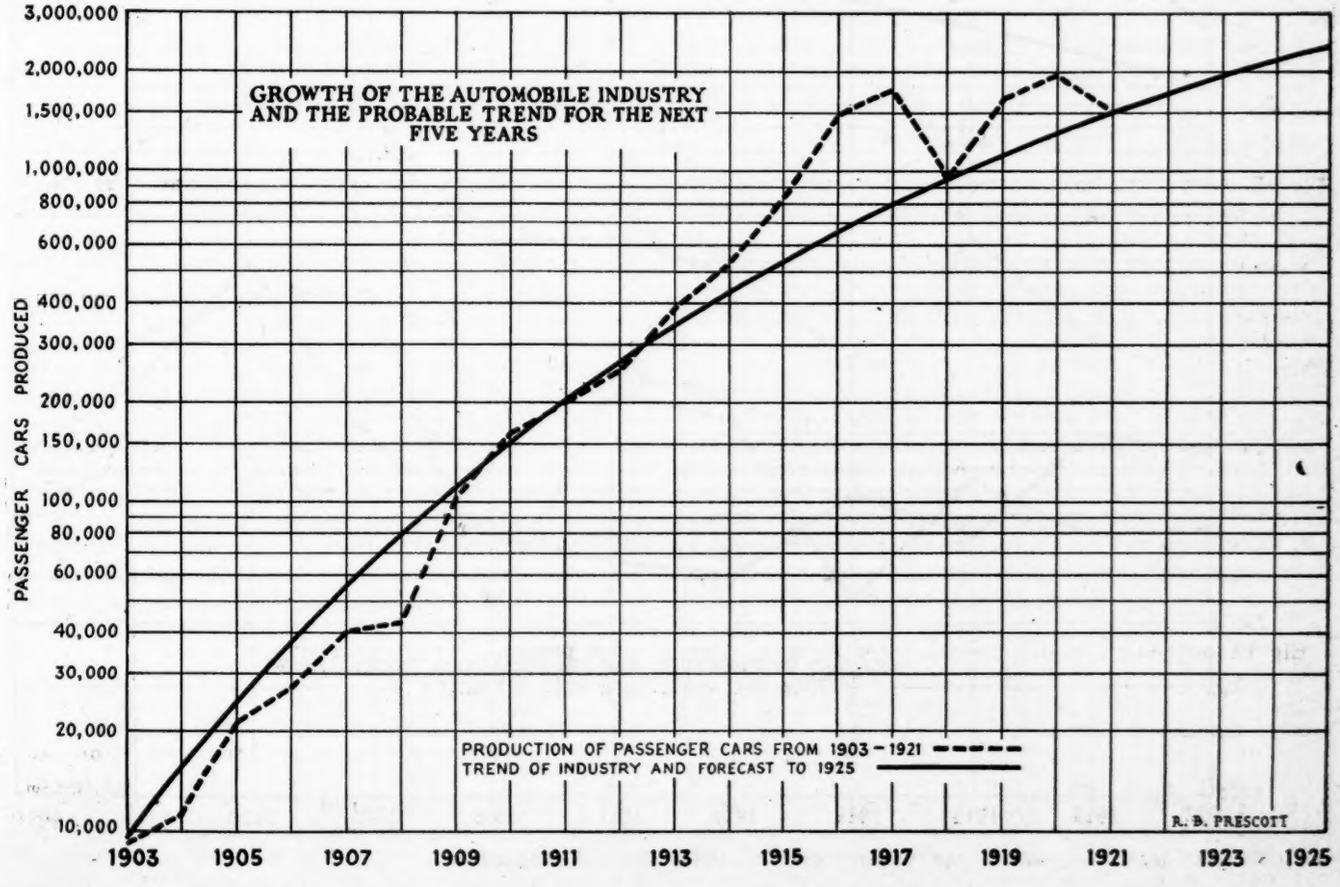
1,457,000 passenger cars were produced in 1921. Truck production was about 150,000, while 50,000 tractors and 25,000 motorcycles were made. Passenger car plants operated at 60 per cent of capacity. 25 per cent of 1921 cars were closed jobs. One ton trucks predominate.

By Raymond B. Prescott

PASSENGER car manufacturing plants fared better than the other units of the automotive industry during 1921, although the industry as a whole operated on a better basis than did many others. The following figures indicate in a general way the proportion of production capacity utilized by the various units of the automotive industry in getting out their 1921 production. It will be recognized, of course, that the term "production" capacity is subject to some variation in definition and that the capacity figures used are, consequently, approximations:

Product	1921 Production	Approximate Capacity	Per Cent of Capacity, 1921
Passenger Cars ..	1,457,000	2,500,000	60
Trucks	150,000	350,000	43
Tractors	50,000	200,000	25
Motorcycles	25,000	100,000	25
Tires	.....	.....	..
Casings	20,000,000	30,000,000	67
Inner Tubes	25,000,000	35,000,000	70

The figures for passenger cars are accurate, while the truck figures contain a small percentage of error. This slight error is due to the fact that the production figures



Analysis of Passenger Car Sales by Number and Per Cent.

Year	Under $1,000	$1,000-$1,999	$2,000-$2,999	$3,000-$3,999	$4,000 and Over
1905	8,023	10,650	1,253	664	941
	.372	.495	.058	.031	.044
1906	6,858	13,854	2,611	1,119	2,256
	.257	.519	.098	.044	.082
1907	13,321	18,148	4,109	497	4,483
	.328	.447	.101	.012	.112
1908	19,322	15,801	2,902	559	4,654
	.447	.366	.067	.013	.107
1909	41,191	44,440	4,131	6,151	6,785
	.400	.434	.040	.060	.066
1910	53,320	81,658	8,221	5,854	9,050
	.337	.516	.052	.037	.058
1911	No figures available.				
1912	128,704	87,274	13,360	5,352	9,055
	.528	.357	.055	.022	.038
1913	236,092	111,253	18,219	5,233	9,947
	.620	.292	.048	.014	.026
1914	352,397	128,950	35,480	7,435	5,208
	.665	.244	.067	.014	.010
1915	638,333	155,592	16,010	3,407	6,765
	.778	.190	.020	.004	.008
1916	1,129,393	197,144	26,877	11,087	3,984
	.825	.144	.020	.007	.003
1917	1,418,351	247,058	35,728	12,947	4,392
	.826	.144	.020	.007	.003
1918	735,346	153,667	33,635	3,290	5,239
	.789	.165	.036	.004	.006
1919	1,040,750	499,924	75,502	25,280	9,616
	.630	.303	.046	.015	.006
1920	1,185,407	590,780	86,201	23,841	29,758
	.622	.310	.045	.012	.016
1921	1,071,553	291,432	62,144	18,308	13,311
	.735	.200	.042	.013	.01
1922*	1,326,000	306,000	42,500	17,000	8,500
	.78	.18	.025	.01	.005

*Estimated.

Fig. 2—Passenger car production by price classes 1905-1921 inclusive, with prediction for 1922

of the entire truck industry are not collected and exact figures are available for only about 80 per cent of the industry.

Motorcycle figures are very nearly accurate, although not exact, while tractor figures comprise an intelligent estimate. Tire figures are those of the *Tire Rate Book.*

The completeness and accuracy of the passenger car figures make it possible to analyze passenger car produc-

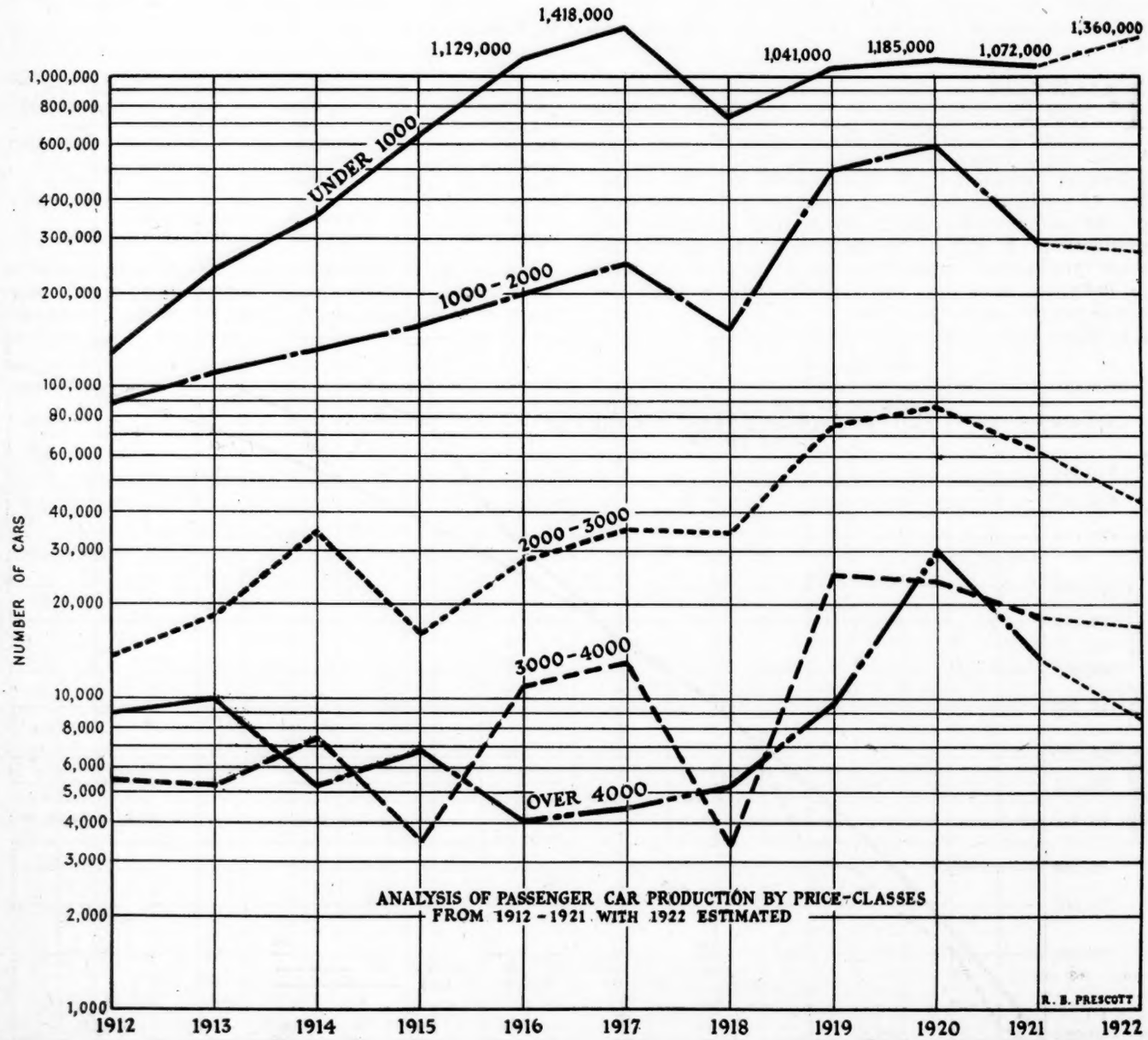


Fig. 3

	1915	1916	1917	1918	1919	1920	1921
Under 1,000	.014	.014	.03	.06	.09	.16	.21
1-2,000	.03	.04	.05	.06	.08	.12	.18
2-3,000	.07	.10	.24	.22	.24	.22	.36
3-4,000	.08	.10	.10	.20	.27	.43	.41
Over 4,000	.27	.37	.33	.25	.27	.30	.47
Total	.015	.015	.04	.07	.10	.18	.25

Fig. 4—Closed car production by years and price classes, 1915-1921.

tion in considerable detail. The chart shown in Fig. 1 indicates the actual as compared with the normal passenger car production since 1903, the normal curve being extended to 1925. A thorough analysis of this normal curve, together with a complete explanation of the sound basis upon which it was built up, was published in AUTOMOTIVE INDUSTRIES of Nov. 17. Fig. 1 is identical with the chart shown in the previous article, except that the actual production figures for 1921 have been inserted.

1921 Meets Normal Curve

A detailed discussion of the chart is not necessary in the present article. It is interesting to note, however, that the 1921 production figures just meet the normal curve. This indicates that the 1921 car production would have been just what it was had there been no war and had industry not been inflated as a result. The difference in actual conditions, however, would have rested in the fact that production capacity and actual production would have very nearly coincided had war inflation not taken place.

Thus it would appear that we are already back to normal in the sense that passenger car production has been adjusted to the normal demand. The chart shows, however, that not until 1923 will we be back to normal as regards the proper balance of production and production capacity; this is assuming production capacity to be about equal to the peak production in 1920.

Production by Price Classes

Fig. 2 gives the passenger car production by price classes from 1905 to 1921 inclusive, together with a prediction for 1922. The 1921 figures bring out an interesting point as regards the 1922 prediction. In AUTOMOTIVE INDUSTRIES of Dec. 22 these figures were presented up to 1920, and a prediction for 1921 was made without the use of any figures except those previous to and including 1920. At that time the percentage of total production comprised in each price class was calculated. The closeness with which this prediction came true is strikingly revealed by the following comparison:

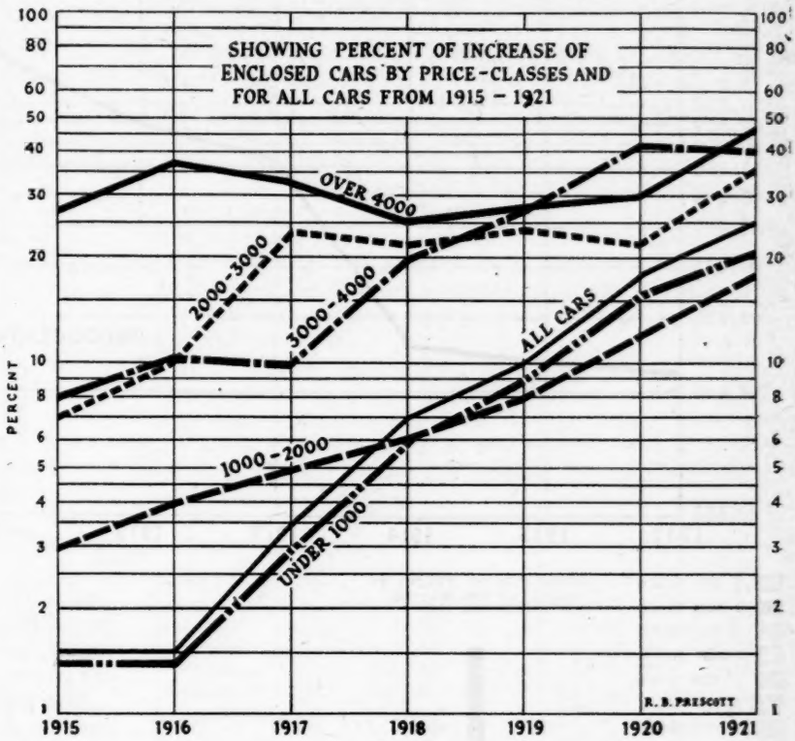


Fig. 5

PERCENTAGE OF PRODUCTION BY QUARTERS FROM 1912 TO 1921

	1st	2nd	3rd	4th
1912	.243	.317	.175	.264
1913	.204	.338	.213	.250
1914	.246	.306	.248	.206
1915	.189	.244	.290	.278
1916	.240	.288	.256	.216
1917	.272	.296	.232	.201
1918	.272	.260	.238	.130
1919	.192	.258	.260	.290
1920	.303	.316	.268	.113
1921	.147	.300	.323	.224

FIG. 6

	Under $1000	$1000-$2000	$2000-$3000	$3000-$4000	Over $4000
Calculated	75%	19%	4%	1%	1%
Actual	73.5	20	4.2	1.3	1

This merely furnishes another indication of the soundness of the basis upon which the normal curves have been built up and the degree of accuracy which can be expected in future predictions for 1922 and other years.

Fig. 3 shows in graphic form passenger car production by price classes for the years 1912 to 1921 inclusive, the 1922 prediction being included as well. This shows that there will be about 1,326,000 passenger cars produced in the "Under $1,000" class during the coming year, a larger number than was produced during 1921 in this class. The number produced in each of the other price groups will probably drop slightly, the sharpest decline probably occurring in the "Over $4,000" class.

A comprehensive survey of closed car production figures has just been completed by AUTOMOTIVE INDUSTRIES and the compiled results are presented here for the first

PASSENGER CARS MANUFACTURED BY STATES FROM 1912-1921

	Mich.	Ind.	Ohio	N. Y.	Ill.	Wis.	Conn.	Mass.	Mo.	N. J.	Pa.	Va.	Ga.	Kan.	So. Car.
1912	193,307	5,305	32,914	9,653	1,218	11,482	2,016	851	894	375	724				
1913	296,877	8,188	42,901	6,385	3,100	13,541	2,018	721	1,205	573	582	113			
1914	432,156	7,990	51,637	5,826	2,108	15,551	1,230	591	1,454	502	388	106			
1915	636,721	17,329	102,562	6,550	3,099	22,795	943		1,015	527	4,300	22			
1916	1,041,971	29,083	156,586	7,153	7,092	41,477	895		2.632	740	5,364	119			
1917	1,341,857	37,918	150,225	12,653	10,975	32,016	762		2.067	685	1,574	205			
1918	671,943	21,561	97,343	8,066	10,111	24.234	370		1,464	360	415	191			
1919	1,344,346	34,557	94,661	11,659	14,292	49,150	484		1,930	583	875	269		249	751
1920	1,488,707	39,837	142,015	13,034	22,021	52,165	785	33	2,813	968	1,464	195	32	188	1,180
1921	1,315,366	22,128	66,692	10,504	9,463	24,663	327	158	5,797	495	543	145	375		481

FIG. 7

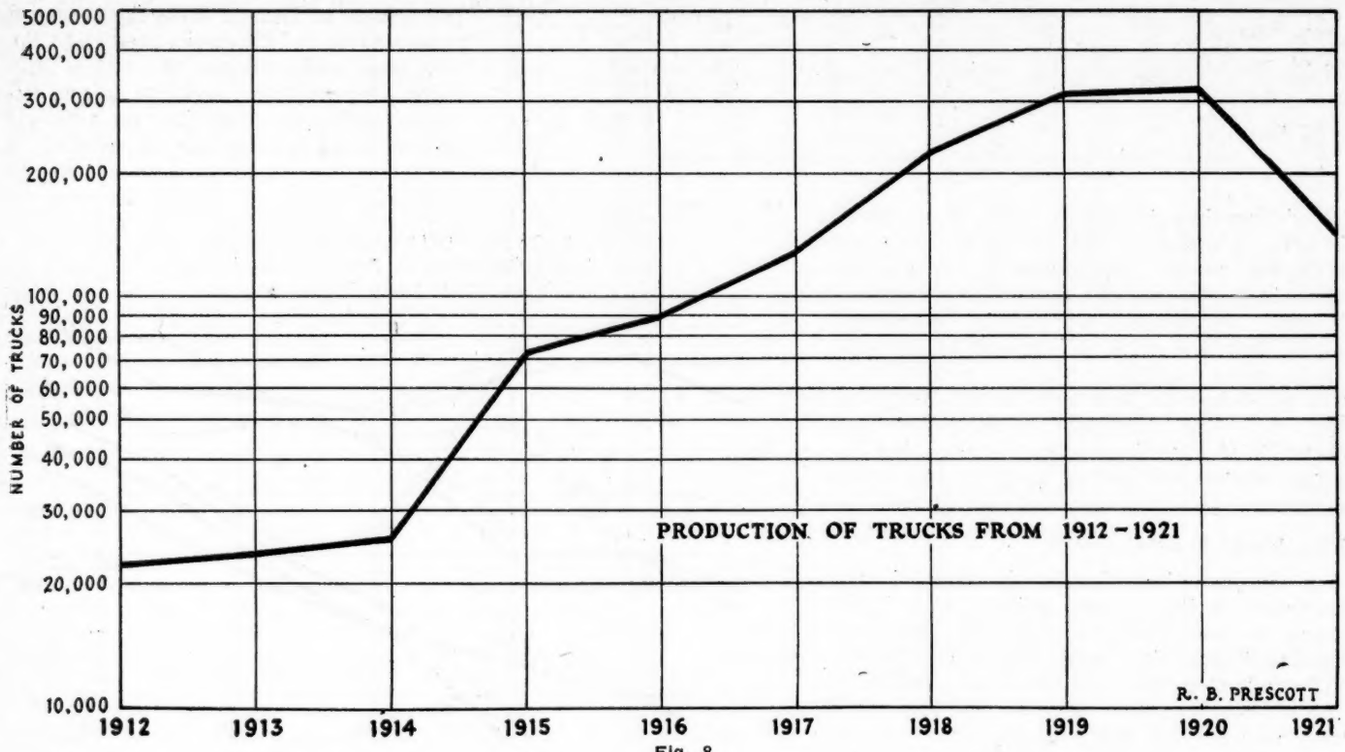


Fig. 8

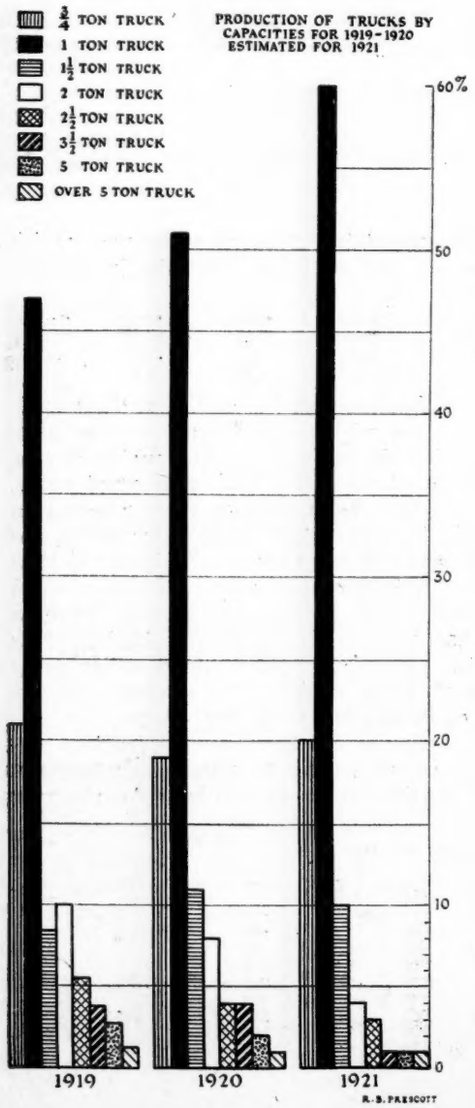


Fig. 9

time. This constitutes probably the most accurate survey of this kind that has ever been made and is especially timely in view of the greatly increased interest in closed car construction throughout the industry.

The percentage of total production comprised of closed cars is shown in tabular form in Fig. 4 and in graphic form in Fig. 5. The results of the survey are shown thus in percentages because in this way the relative importance of the closed car can best be visualized.

The figures show that there has been an increase in closed car production in every price class in practically every year since 1915. The only variation is in the $2,000-$3,000 class in the years 1917 and 1918. In a general way it would appear that the proportion of closed cars varies directly as the price rises, although this proportion is inverted in the case of the two lower price classes. The percentage variation in this case, however, is so small as to be negligible.

Taking all price classes together, the percentage of closed cars has steadily increased until, in 1921, 25 per cent of the total production was comprised of closed jobs. Over 40 per cent of the high-priced cars were closed jobs in 1921. It will be interesting to note the effect in the various price class percentages of the development of utility closed cars.

Production by quarters is shown in Fig. 6. The striking thing about this table is the revelation that there is very little variation in the percentage of total output produced during each of the four quarters. A survey of the ten years shown indicates that in any given year the variation between quarters is not more than 10 per cent. This holds true throughout, except for the last quarter of 1920 and the first quarter of 1921, where greater variations are noted. Since these are the only ones for ten years, however, it is reasonable to say that they are probably the result of a temporary and peculiar economic condition rather than any indication of a trend.

The slight variations shown are rather startling when analyzed in connection with the general conception of the passenger car industry as a seasonable one. These

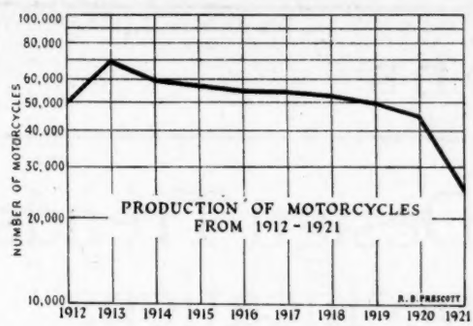


Fig. 10

figures indicate a comparatively constant production throughout the year.

Passenger car production by states is shown in Fig. 7. Michigan has led in car production ever since 1912, while Ohio has followed each year. The table is interesting in many ways and serves to show something of the scope of the car manufacturing industry alone. In 1921 the five leading states in order of production stood as follows:

Michigan	1,315,366
Ohio	66,692
Wisconsin	24,663
Indiana	22,128
New York	10,504

Truck production from 1912 to 1921 inclusive is shown in Fig. 8. It will be noted that the curve is not nearly so uniform as that for passenger cars. This indicates that the truck has not yet found its exact niche in transportation and that further development will be necessary before it attains its maximum possibilities. Truck production, moreover, was affected to a greater relative degree by war inflation than was the case with passenger cars.

Truck production by tonnage groups is shown in the interesting chart, Fig. 9. Only three years' figures are available for this chart, so that a definite trend can hardly be determined. The chart does appear to show the predominance of the 1-ton truck, occasioned chiefly by the numerical predominance of Ford production. There appears to be a tendency for the 1-ton truck predominance to increase. With minor exceptions, the expected results are shown from this analysis, in that greater numbers of small trucks and fewer large trucks are produced. These figures do not, of course, take any account of values.

The trend of motorcycle production is shown in Fig. 10. This chart indicates a steadily falling production since 1913 and quite a heavy drop during 1921. The figures are presented here without any special critical analysis, as such discussion would involve the consideration of many outside factors.

FIFTEEN MILLION DOLLARS has been apportioned by the Secretary of Agriculture among twenty-seven States, Alaska, and Porto Rico for the construction of national forest roads and trails. Of this sum, $9,500,000, known as the "National Forest Highway Funds," is set aside for roads of primary importance to States, counties, and national forest communities; $5,500,000, constituting the "National Forest Development Fund," will be used for the construction of roads and trails needed for the administration and utilization of the forests themselves.

The distribution by States of the National Forest development and National Forest highway funds is as follows:

State	National Forest Highway Fund	National Forest Development Funds	Totals
Alabama	4,880	5,799	10,679
Alaska	970,271	50,222	1,020,493
Arizona	598,189	280,722	878,911
Arkansas	70,365	72,573	142,938
California	1,460,871	703,822	2,164,693
Colorado	717,058	336,360	1,053,418
Florida	25,118	8,730	33,848
Georgia	13,355	20,347	33,702
Idaho	1,097,894	1,088,656	2,186,550
Maine	2,760	4,754	7,514
Michigan	3,638	6,220	9,858
Minnesota	60,929	65,621	126,550
Montana	878,886	574,615	1,453,501
Nebraska	11,065	11,159	22,224
Nevada	207,984	55,377	263,361
New Hampshire	35,294	24,276	59,570
New Mexico	458,258	219,652	677,910
North Carolina	27,856	46,984	74,840
Oklahoma	5,645	8,764	14,409
Oregon	1,157,109	718,555	1,875,664
Porto Rico	1,454	5,344	6,798
South Carolina	1,572	8,704	10,276
South Dakota	77,553	64,139	141,692
Tennessee	20,896	23,243	44,139
Utah	371,776	164,258	536,034
Virginia	26,140	46,512	72,652
Washington	708,133	602,889	1,311,022
West Virginia	6,051	14,602	20,653
Wyoming	479,000	267,101	746,101
Totals	9,500,000	5,500,000	15,000,000

FRENCH aerial navigation companies numbered 4 in 1919, 10 in 1920 and 8 in 1921. Two companies ceased operation in 1921. Nearly all the machines are war types or modified war types, and have not been specially designed for commercial service. Services began in 1919 on a very small scale, but the increase has been progressive. The average commercial speed realized on the various lines (all stops included) is 37 miles for Toulouse-Casablanca; 62 miles for Paris, Brussels, Rotterdam, Amsterdam; 70 miles for Paris-Warsaw and 70 to 90 miles for Paris-London.

Up to Sept. 1, 1921, the distance covered in regular service was 1,744,810 miles, with 10 deaths and 14 cases of injury, this including both passenger and crew. This gives one death per 174,481 miles and one injury per 124,630 miles. The time saved through the use of these various aerial routes is 5 hr. to London and Amsterdam, 13 hr. to Warsaw and 70 hr. between Toulouse and Casablanca.

On the attached table the rate of fares on the various lines radiating from Paris are given in francs, also freight charges in francs and rate per kilometre for mail, freight and passengers.

FRENCH AERIAL LINES

ROUTE	Distance Miles	Mail Rates Per ⅝ Oz. Francs	FREIGHT CHARGES		PASSENGER FARES	
			Per Kilo-Francs	Per Kilometre	Francs	Per Kilometre
Paris-London	232	0.50	5 to 7.50	.0133	300	.80
Paris-Brussels	155	0.30	3 to 4	.013	175	.67
Paris-Amsterdam	273	0.50	5 to 6.50	.013	300	.68
Paris-Strasbourg	248	0.75	2.50	.006	150	.375
Paris-Prague	559	1.25	7.00	.0077	500	.55
Paris-Warsaw	870	1.75	9.00	.0084	800	.37
Toulouse-Casablanca	1149	0.50	9.00	.0048	1560	.86
Bagaure-Santanda	124	0.25	2.50	.0012	150	.75
Paris-Settano	186	.....	3.50	.0116	200	.68
Bordeaux-Montpellier	261	.....	6.60	.0157	176	.40
Nimes-Nice	217	.....	4.50	.013	240	.68

Specifications

American Passenger Car Design Trends as Revealed by 1922 Specifications

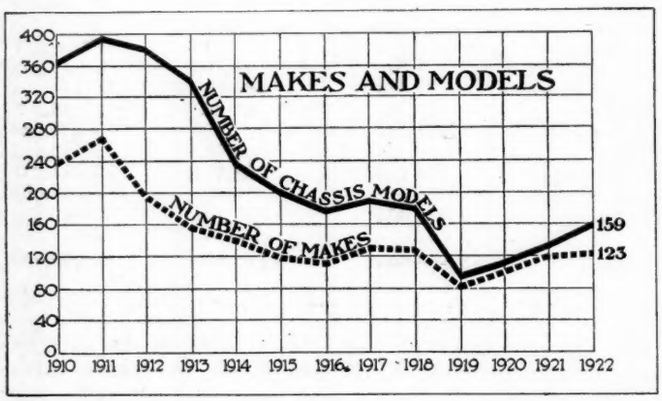
Slight increase in percentage of six and eight-cylinder engines with corresponding decrease in fours and twelves. More chassis models and more makes are listed this year. Plate and multiple-disk clutches predominate. Spiral bevel final drive now almost universally employed.

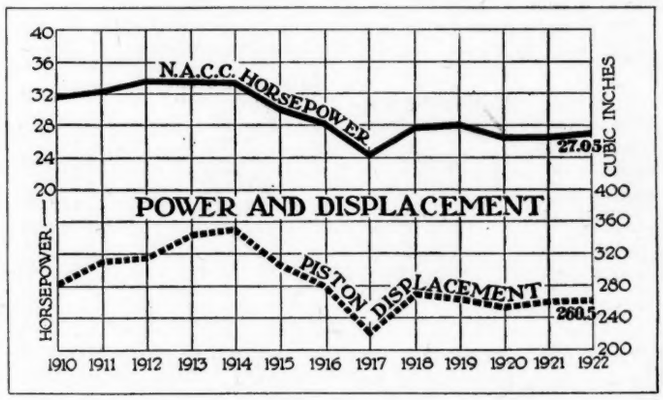
By Herbert Chase

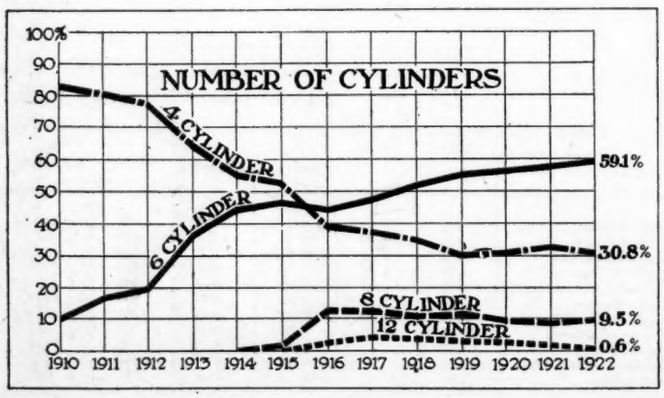
IT was not to be expected that the 1922 specifications for American passenger car chassis would show any marked deviation from what has come to be regarded as "standard practice" for the industry has become too stable and too much involved in the business of economical quantity production to be stampeded into making many radical changes from year to year. It is a well recognized fact that the companies which turn out substantially the same chassis year after year are in general those which have the reputation for making the most dependable and satisfactory products in their respective price classes, and which have therefore been most successful from a commercial standpoint. This may not be a policy which favors the development of the most perfect design from a purely engineering standpoint, but so long as conditions, such for example as those imposed by the character and quantity of the fuel supply, do not change it is doubtless the most satisfactory from the user's standpoint as well as the most profitable for the manufacturer. For this reason it is probable that even if a simple change in engine design could be made to-day which would result in doubling the mileage per gallon of fuel (and such a thing is quite possible, not to say probable), such change would not be incorporated in any considerable percentage of cars for several years to come.

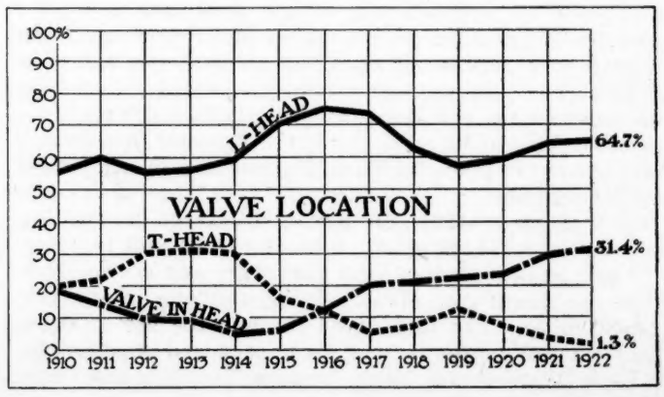
Trends in design are best illustrated by reference to the accompanying charts on which are plotted curves

(*Continued on page* 336)

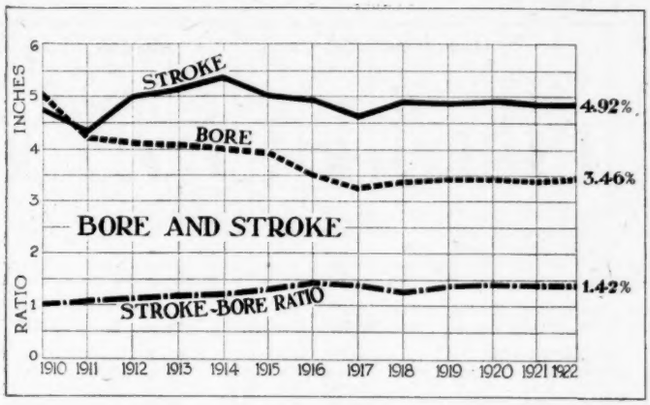


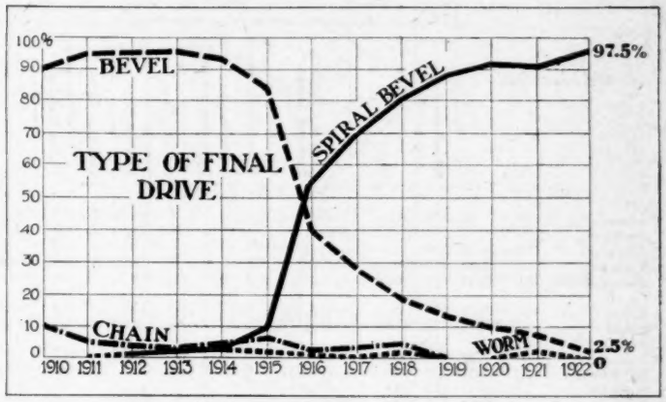


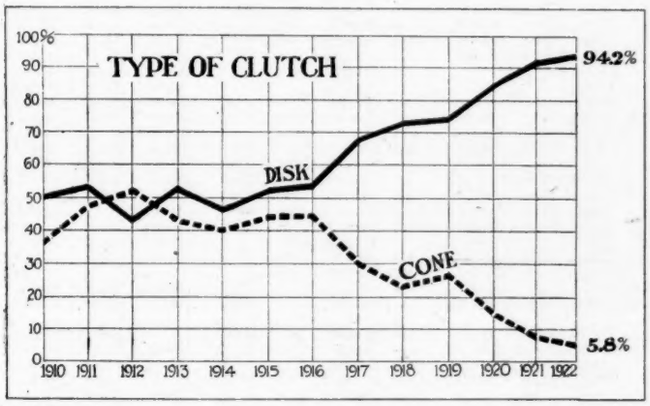


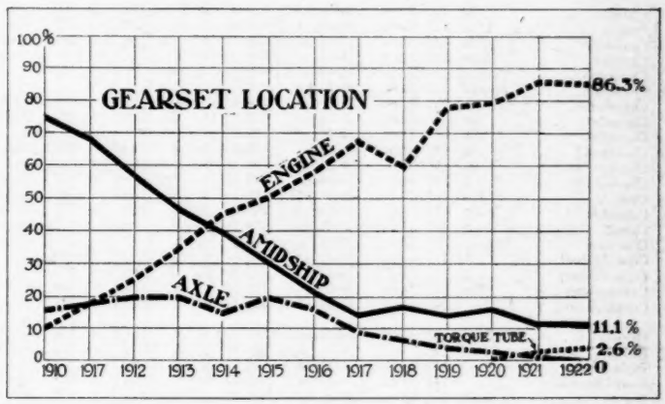


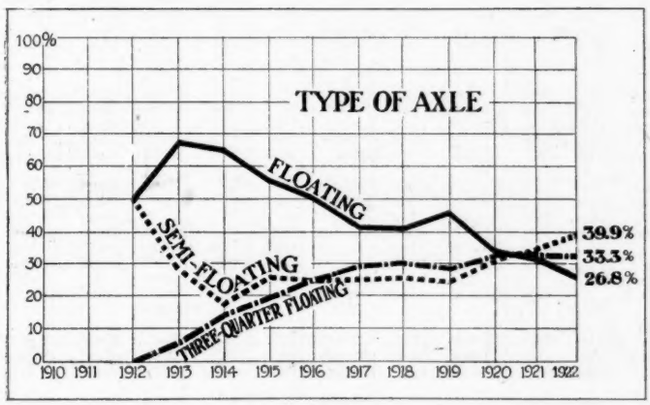
Tendencies in Passenger Car Design, 1910-1922

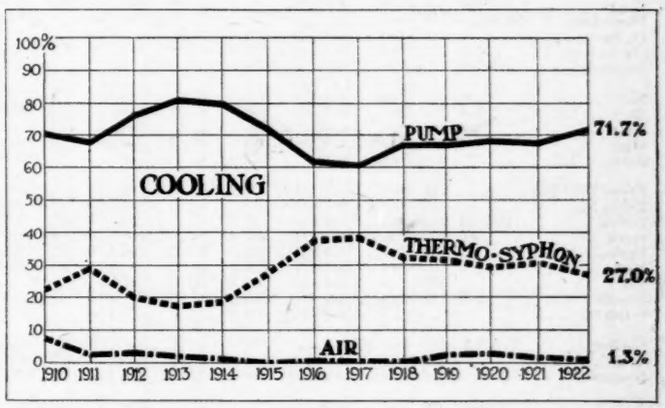


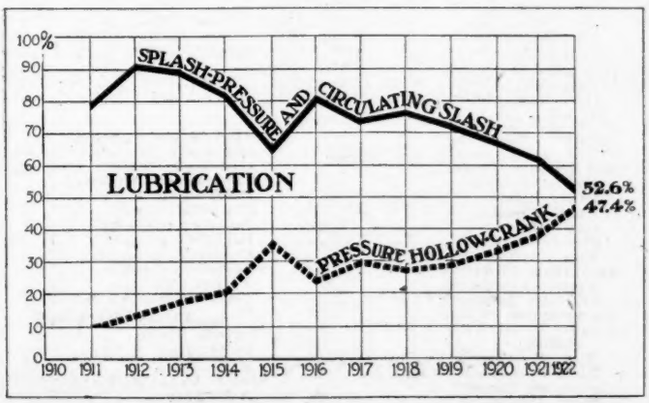


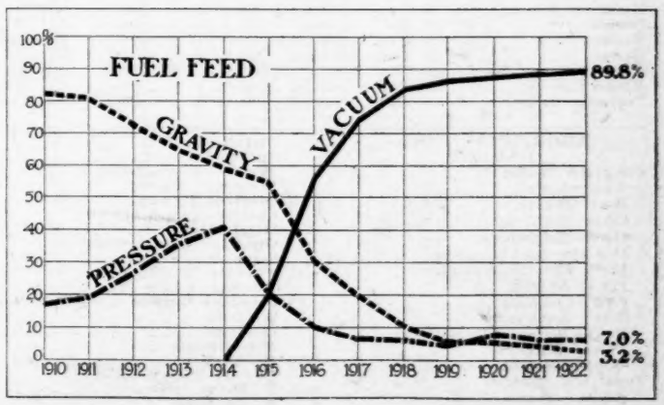












Passenger Car

Make and Model	Wheelbase	ENGINE											LUBRICATION		FUEL SYSTEM		IGNITION SYSTEM				
		Make	Number Cylinders, Bore and Stroke	Piston Displacement Cu. In.	Point Suspension	Cylinder Type	Cylinder Head	Cylinders Cast	Piston Material	Camshaft Drive	Cooling	Cooling Control	System	Type of Pump	Carbureter Make	Fuel Feed	Type	Make	Control	Generator Make	Voltage
Ambassador R	136	Con	6-3 5/8x5 1/4	356.1	3	H	Det.	6	CI	Chain	Pump	None	Hol-Crk	Gear	Stromb	Vac	Cl-Cir	Bosch	Hand	West	6
American C	127	H-S	6-3 1/4x5	248.9	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl		Stromb	Vac	Cl-Cir	At-K	Hand	G&D	6
Anderson Series 40	120	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Rayfld	Vac	Op-Cir*	Remy	Hand	Remy	6
Apperson Eight	130	Own	8-3 1/4x5	331.8		T	Det.	4	CI	Met-Gear	Ther	None	Hol-Crk	Gear	Johnsn	Vac	Cl-Cir*	Remy	Hand	Bijur	6
Auburn, Beauty Six 6-51	121	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Rayfld	Vac	Op-Cir	Remy	Hand	Remy	6
Beggs 20-T	120	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Stromb	Vac		Conn	Hand		
Biddle B-1, B-5	121	Buda	4-3 3/8x5 1/2	226.4	3	H	Int.	4	Al	Met-Gear	Ther	None	Cir-Spl	Gear	Zenith	Vac	Cl-Cir	Simms	Hand	G&D	
	125																				
Brewster 02	125	Own	4-4x5 1/2	276.5	4	S	Det.	4	CI	Chain	Pump	None	Hol-Crk	Gear	Zenith	Vac		Bosch	Hand	USL	12
Buick Four 22-34-37	109	Own	4-3 3/8x4 3/4	170.0	3	H	Det.	4	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Marvel	Vac	S-pt	Delco	Hand	Delco	6
Buick Six 22-44-47	118	Own	6-3 3/8x4 1/2	241.6	3	H	Int.	6	CI	Non-Met-G	Pump	None	Cir-Spl	Gear	Marvel	Vac	S-pt	Delco	Hand††	Delco	6
Buick Six 22-48-50	124	Own	6-3 3/8x4 1/2	241.6	3	H	Int.	6	CI	Non-Met-G	Pump	None	Cir-Spl	Gear	Marvel	Vac	S-pt	Delco	Hand††	Delco	6
Cadillac 61	132	Own	8-3 1/2x5 1/4	314.4	3	L	Det.	4	CI	Chain	Pump	Ther	Hol-Crk	Gear	Own	Pr	D-pt	Delco	Auto	Delco	6
Case X	122	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	Ther	Hol-Crk	Gear	Rayfld	Vac	Cl-Cir*	Delco	Hand	Bijur	6
Chalmers 6-30	117	Own	6-3 1/4x4 1/2	224.0	4	L	Det.	6	Al	Chain	Ther	None	Cir-Spl	Gear	Stromb	Vac	Cl-Cir	Remy	Hand	Aut-L	6
Chalmers 6-30	122	Own	6-3 1/4x4 1/2	224.0	4	L	Det.	6	Al	Chain	Ther	None	Cir-Spl	Gear	Stromb	Vac	Cl-Cir	Remy	Hand	Aut-L	6
Champion Tourist	113	Lyc	4-3 1/2x5	192.4		L		4			Ther				Zenith			Dynet	Hand	Dynet	
Champion Special	118	H-S	4-3 1/2x5	192.4		L		4			Ther				Zenith			Dynet	Hand	Dynet	
Chandler Six	123	Own	6-3 1/2x5	288.6		L		6		Chain	Pump		Cir-Spl	Pist	Rayfld	Vac		Bosch	Hand	Bosch	6
Chevrolet 490	102	Own	4-3 1/4x4	170.9	4	H	Det.	4	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Zenith	Gra	Cl-Cir	Remy	Hand	Aut-L	6
Chevrolet FB	110	Own	4-3 1/4x5 1/4	224.3		L		4			Pump	None	Cir-Spl	Gear	Zenith	Vac		Remy		Aut-L	
Cleveland 40	112	Own	6-3x4 1/2	190.8	4	H	Det.	6	CI	Chain	Pump	None	Cir-Spl	Gear	Stromb	Vac	Op-Cir*	Bosch	Hand	Bosch	6
Climber Four K	117	H-S	4-3 1/2x5	192.4	3	H	Det.	4	CI	Com-Gear	Ther	None	Cir-Spl		Stromb	Vac	D-pt	At-K	Hand	West	6
Climber Six S	126	H-S	6-3 1/4x5	248.9		H	Int.	6	CI	Met-Gear	Pump	None	Cir-Spl		Stromb	Vac	D-pt	Bosch	Hand	West	6
Cole 890	127	Nor	8-3 1/2x4 1/2	346.3	3	L	Det.	4	Al	Com-Gear	Pump	Ther	Cir-Spl	Gear	Johnsn	Vac	D-pt	Delco	Hand	Delco	6
Columbia CC	115	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	Ther	Cir-Spl	Gear	Stromb	Vac	Cl-Cir*	At-K	Hand	Aut-L	6
Comet 6-CS3-2	125	Con	6-3 1/2x5 1/4	303.1	3	H	Det.	3		Met-Gear	Pump	None	Cir-Spl	Pist	Stromb	Vac	Op-Cir	Wagnr	Hand		
Crawford 22-6-49	122	Con	6-3 1/2x5 1/4	303.1		L		6		Chain	Pump		Cir-Spl		Stromb	Vac		At-K	Hand	West	6
Crow-Elkhart L	117	Lyc	4-3 1/2x5	192.4	3	L	Det.	4	CI		Ther	None	Cir-Spl	Gear	Zenith	Vac		Conn	Hand	Dynet	
Crow-Elkhart S	117	H-S	6-3 1/4x5	248.9	3	L	Det.	6	CI		Pump	None	Cir-Spl	Gear	Stromb	Vac		Conn		Dynet	
Cunningham V-4	132	Own	8-3 3/4x5	441.7	4	L	Det.	4	Al	Non-Met-G	Pump	Ther	Hol-Crk	Gear	Stromb	Vac	D-pt	Delco	Hand††	Delco	6
Cunningham	142	Own	8-3 3/4x5	441.7	4	L	Det.	4	Al	Non-Met-G	Pump	Ther	Hol-Crk	Gear	Stromb	Vac	D-pt	Delco	Hand	Delco	6
Daniels D-19	132	Own	8-3 1/2x5 1/4	404.1	3	L	Det.	4	CI	Met-Gear	Pump	None		Gear	Zenith	Pr	D-pt		Hand††	Delco	6
Davis 61-67	120	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Stromb	Vac		Delco	Hand	Delco	
Dixie Flyer H	112	H-S	4-3 1/2x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Gear	Stromb	Vac	S-pt	Eisem	Hand	Dynet	6
Dodge Brothers	114	Own	4-3 7/8x4 1/2	212.3	3	L	Det.	4	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Stewart	Vac	Cl-Cir*	N.E	Auto	N.E	12
Dorris 6-80	132	Own	6-4x5	377.0	4	H	Det.	3	CI	Met-Gear	Pump	None		Gear	Stromb	Vac	S-pt	Bosch	Hand	West	6
Dort 19	108	D-Lyc	4-3 1/2x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Pist	Carter	Vac	Cl-Cir	Conn	Hand	Bosch	6
Driggs 1922	104	Own	4-2 5/8x4 1/2	97.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Gear	Zenith	Vac	Cl-Cir	Bosch	Hand	Bosch	6
Duesenberg Straight 8	134	Own	8-2 7/8x5	259.7	3	H	Det.	8	Al	Met-Gear	Pump	None	Hol-Crk	Gear		Vac	Cl-Cir**	Delco	Hand	Delco	6
Du Pont A	124	Own	4-3 1/4x5 1/4	249.6		L					Pump		Cir-Spl	Gear	Yale&T	Vac	S-pt	Eisem	Hand	West	6
Durant Four A-22	109	Own	4-3 7/8x4 1/4	200.4	4	H	Det.	4	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Tillot	Vac	Cl-Cir	Aut-L	Hand	Aut-L	
Durant Six B-22	123½	Ans	6-3 1/4x4 1/2	224.0		L					Pump					Vac		Aut-L			
Earl 40	112	Own	4-3 7/16x5 1/4	194.9	4	L	Det.	4	CI	Non-Met-G	Ther	None	Cir-Spl	Pist	Scoe	Vac	S-pt	Conn	Hand	Aut-L	6
Elcar K-4	118	Lyc	4-3 1/2x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Pist	Stromb	Vac	Op-Cir	Delco	Hand	Delco	6
Elcar 7-R	118	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Com-Gear	Pump	None	Hol-Crk	Gear	Stromb	Vac	Op-Cir	Delco	Hand	Delco	6
Elgin K-1	118	Falls	6-3 1/4x4 1/4	195.6	3	H	Det.	6	CI	Met-Gear	Ther	None		Econ	Stromb	Vac	Cl-Cir	Wagnr	Hand	West	6
Essex	108½	Own	4-3 9/16x5	178.9	4		Det.	4	Al	Met-Gear	Ther	Shut	Cir-Spl	Pist	Own	Vac	Cl-Cir*	Bosch	Hand††	Bosch	6
Falcon Light Four	115	Own	4-3 1/16x5	192.4	3	L	Det.	4	CI	Com-Gear	Ther	None	Hol-Crk	Gear	Stromb	Vac	Op-Cir	At-K	Hand	West	6
Falcon Six	115	Own	6-3 1/16x5	230.1	3	L	Det.	6	CI	Com-Gear	Pump	None	Cir-Spl	Econ	Stromb	Vac	Op-Cir	At-K	Hand	West	6
Falcon 12-D-22	100	Own	4-2 3/4x4	95.0	3	L	Det.	4	Al	Chain	Ther	None	Cir-Spl	Gear	Zenith	Vac			Hand	Bosch	6
Ferris 60	130	Con	6-3 1/2x5 1/4	303.1	3	L	Int.	6	CI	Non-Met-G	Pump	None	Cir-Spl	Pist	Zenith	Vac		Split	Hand	L-Nev	6
Ferris 70	130	Con	6-3 5/8x5 1/4	325.1	3	L	Det.	6	CI	Chain	Pump	None	Hol-Crk	Gear		Vac	Cl-Cir	Split	Hand††	L-Nev	6
Ford T	100	Own	4-3 3/4x4	176.7	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl		Own	Gra	Op-Cir	Own	Hand	Own	6
Fox	132		6-3 1/4x5	248.9		H	Int.								Zenith	Vac		Bosch		West	
Franklin 9-B	115	Own	6-3 1/4x4	199.1	3	H	Int.	1	Al	Non-Met-G	Air	None	Hol-Crk	Gear	Own	Vac	Cl-Cir*	At-K	Auto	N.E	12
Frontenac			4-3 5/8x5 1/2	196.8		L					Ther							Delco			
Gardner R.T.S.	112	Lyc	4-3 1/16x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Pist	Carter	Vac	Cl-Cir**	West	Hand	West	6
Grant	116	Wal	6-3 1/16x4 1/2	207.1	3	H	Det.	6	CI	Non-Met-G	Ther	None	Cir-Spl	Gear	Stromb	Vac	Cl-Cir	At-K	Hand	Bijur	6
Goodspeed	124	Own	4-3 3/4x5 1/2	226.4	3		Det.	4	CI	Chain	Pump	Ther	Hol-Crk		Rayfld	Pr	Op-Cir	Split	Auto	West	6
H. C. S. Series 3	120	Wei	4-3 3/4x5 1/2	210.6	4	H	Det.	4	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Stromb	Pr		Delco	Hand	Delco	
Handley-Knight B	125	Knt	4-4 1/2x4 1/2	240.6	3	S	Det.	4	Al	Chain	Ther	None	Hol-Crk	Econ	Tillot	Vac	Cl-Cir	Aut-L	Auto	Aut-L	
Hanson 60	121	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Marvel	Vac		Delco	Hand	Delco	6
Hatfield A-42	115	H-S	4-3 1/2x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Gear	Zenith	Vac	Op-Cir*	Conn	Hand	Dynet	6
Haynes 75	132	Own	6-3 1/2x5 1/4	299.0	3	L	Det.	6	CI	Chain	Pump	Ther	Hol-Crk	Gear	Stromb	Vac	Cl-Cir*	King	Hand	L-Nev	6
Haynes 55	121	Own	6-3 1/2x5	288.6	3	L	Int	6	CI	Met-Gear	Pump	None	Cir-Spl	Pist	Rayfld	Vac	Cl-Cir*	King	Hand	L-Nev	6
Holmes Series 4	126	Own	6-3 1/2x4 1/2	259.8	3	H	Det.	1	Al	Non-Met-G	Air		Cir-Spl	Gear	Stromb	Vac		Eisem	Auto	Dynet	12
Hudson Super-Six	126	Own	6-3 1/2x5	288.6	4	L	Det.	6	CI	Met-Gear	Pump	Shut	Cir-Spl	Pist	Own	Vac	Cl-Cir*	Bosch	Hand††	Bosch	6
Hupmobile R	112	Own	4-3 1/4x5 1/2	182.5	3	L	Det.	4	CI	Chain	Ther	None	Hol-Crk	Gear	Stromb	Vac	Cl-Cir	At-K	Hand	West	6

ABBREVIATIONS—ENGINE

Engine Make:
Ans—Ansted.
Bea—Beaver.
Con—Continental.
Due—Duesenberg.
D-Lyc—Dort-Lycoming.
H-S—Herschell-Spillman.
Knt—Knight.
Lyc—Lycoming.
Nor—Northway.
R-D—Rochester-Duesenberg.
Wal—Walker
Wei—Weidely.

Ignition Make:
At-K—Atwater-Kent.
Aut-L—Auto-Lite.
Berlg—Berling.
Conn—Connecticut.
Dynet—Dyneto.
Eisem—Eisemann.
N. E.—North East.
Philb—Philbrin.
Split—Splitdorf.
West—Westinghouse.
Wagnr—Wagner.

Ignition Type:
Cl-Cir—Closed Circuit.
D-pt—Double Point.
Op-Cir—Open Circuit.
S-pt—Single Point.
**—Also Double Point.
*—Also Single Point.

Cylinder Type:
D—Dual
H—Head.
Ho—Horizontal.
L—At Side.
L†—At Side and Head.
S—Sleeve.
T—Opposite.

Camshaft Drive:
Com-Gear—Combination Gear.
Met-Gear—Metal Gear.
Non-Met-G—Non-Metal Gear.

Cooling Control:
Shut—Shutter.
Ther—Thermostat.
T & S—Thermostat and Shutter.

Oil Pump Type:
Econ—Eccentric.
Pist—Piston.

Fuel Feed:
Gra—Gravity.
Pr—Pressure.
Vac—Vacuum.

Ignition Control:
Auto—Automatic.
††—Also Automatic.

Generator Make:
Same as IGNITION MAKE including:
G & D—Gray & Davis.
L-Nev—Leece-Neville.

Cylinder Head:
Det—Detachable.
Int—Integral.

Piston Material:
Al—Aluminum Alloy.
CI—Cast Iron.

Cooling:
Ther—Thermo-Siphon.

Lubricaton System:
Cir-Spl—Circulating Splash.
Hol-Crk—Hollow Crankshaft.

Carbureter Make:
B&B—Ball & Ball
Claudl—Claudel.
Johnsn—Johnson.
Rayfld—Rayfield.
Stromb—Stromberg.
Schebl—Schebler.
Tillot—Tillotson.
Yale & T—Yale & Towne.

TRANSMISSION

Clutch Type:
D-M—Disk Multiple.
Pla—Plate.

Rear Axle Make:
Ad—Adams.
Col—Columbia.
Fli—Flint.
Per—Peru.
Sal—Salisbury.
S-P—Stan-Par.
St-P—Standard Parts.

Chassis Specifications

TRANSMISSION						REAR AXLE						TIRES						BRAKES			BEARINGS				Make and Model
CLUTCH		GEARSET																TYPE							
Make	Type	Make	Location	Number Forward Speeds	Universal Joints Type	Rear Axle Make	Final Drive	Rear Axle Type	Direct Gear Ratio	Torque Taken By	Propulsion Taken By	Front	Rear	Wheels, Type	Type Rear Springs	Steering Gear Make	Speedometer Make	Service	Emergency	Location	Gearset	Rear Wheels	Front Wheels, Outer	Front Wheels, Inner	
B-L...	D-M..	B-L...	UnWE..	3	Fab...	Tim...	S-B...	F...	4.45	TA.	Sp..	32x4½	32x4½	.....	½E...	Jac...	S-W..	Ext...	Int...	R-W..	R.....	R.....	R...	R...	Ambassador..... R
B&B..	Pla...	War..	UnWE..	3	Met...	Sal...	S-B...	F...	4.50	Sp..	Sp..	32x4	32x4	.....	½E...	War..	Van..	Ext...	Int...			.....			American..... C
B&B..	Pla...	Dur...	UnWE..	3	Fab...	Sal...	S-B...	¾	4.50	Sp..	Sp..	33x4	33x4	.....	½E...	Gem..	.....	Ext...	Int...	R-W..	B.....	B.....	R...	R...	Anderson..... Series 40
Own..	D-M..	Own..	SepUn..	3	Met...	Own..	S-B...	½	4.25	Sp..	Sp..	34x4½	34x4½	.....	¾E...	Own..	Van..	Ext...	Int...	R-W..	R.....	R.....	R...	R...	Apperson..... Eight
B&B..	Pla...	G-L...	UnWE..	3	Met...	Sal...	S-B...	F...	5.00	TA.	Sp..	32x4	32x4	Art...	½E...	Jac...	S-W..	Ext...	Int...		B.....	B.....	R...	R...	Auburn, Beauty S.x.... 6-53
B&B..	Pla...	Dt....	UnWE..	3	Met...	S-P...	S-B...	¾	4.75	Sp..	Sp..	33x4	33x4	Dis...	½E...	Dit...	S-W..	Ext...	Int...						Beggs..... 20-T
War..	D-M..	War..	UnWE..	4	Met...	S-P...	S-B...	½	4.50	Sp..	Sp..	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W..	R.....	R.....	R...	R...	Biddle..... B-1, B-5
Own..	Cone..	Own..	UnTT..	3	Lea...	Own..	S-B...	F...	.....	TT.	TT.	32x4½	32x4½	Art...	FC...	Own..	S-W..	Int...	Int...	R-W..	.....	.....	.....	.....	Brewster..... 62
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.66	TT.	TT.	31x4	31x4	Art...	½E...	Jac...	S-W..	Ext...	Int...	R-W..	B.....	R.....	B...	B...	Buick Four..... 22-34-37
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.60	TT.	TT.	33x4	33x4	Art...	FC...	Jac...	S-W..	Ext...	Int...	R-W..	B.....	B.....	B...	B...	Buick Six..... 22-44-47
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.90	TT.	TT.	33x4½	33x4½	Art...	FC...	Jac...	S-W..	Ext...	Int...	R-W..	B.....	B.....	B...	B...	Buick Six..... 33-48-50
Own..	D-M..	Own..	UnWE..	3	Met...	Tim...	S-B...	F...	.....	TA.	Sp..	33x5	33x5	.....	Pl...	Own..	.....	Ext...	Int...						Cadillac..... 61
Own..	D-M..	Own..	UnWE..	3	Fab...	Col...	S-B...	½	4.66	Sp..	Sp..	32x4½	32x4½	Art...	½E...	Jac...	S-W..	Ext...	Int...	R-W..	R.....	R.....	R...	R...	Case..... X
Own..	D-M..	Own..	UnWE..	3	Met...	Ad....	S-B...	½	5.12	Sp..	Sp..	32x4	32x4	Art...	½E...	Own..	S-W..	Ext...	Int...	R-W					Chalmers..... 6-30
Own..	D-M..	Own..	UnWE..	3	Met...	Ad....	S-B...	½	5.12	Sp..	Sp..	32x4	32x4	Art...	½E...	Own..	S-W..	Ext...	Int...	R-W..					Chalmers..... 6-30
B&B..	Pla...	G-L...		3	.....	Col...	Bev..	F...				32x3½	32x3½	Art...	½E...							R.....			Champion..... Tourist
B&B..	Pla...	G-L...		3	.....	Col...	Bev..	F...				32x4	32x4	Art...	½E...								R...	R...	Champion..... Special
B&B..	Pla...	Own..	UnWE..	3	.....	Own..	S-B...	F...	4.40	Sp..	....	33x4	33x4	Art...	½E...	CAS..	S-W..				B.....	B.....	R...	R...	Chandler..... Six
Own..	Cone..	Own..	UnWE..	3	Met...	Own..	S-B...	½	3.66	TT.	Sp..	30x3½	30x3½	Art...	¼E...	Own..	S-W..		Int...		B.....	R.....	R...	R...	Chevrolet..... 490
.....	Cone..			3				¾				33x4	33x4	Art...	½E...							R.....	B...	B...	Chevrolet..... FB
B&B..	Pla...	Mec..	UnWE..	3	Met...	Own..	S-B...	½	4.45	Sp..	Sp..	32x4	32x4		½E...	CAS..	Van..	Ext...	Ext...	R&D.	R.....	B&R.	R...	R...	Cleveland..... 40
B&B..	Pla...	Mun..	UnWE..	3	Met...	Ad....	S-B...	F...	4.00	Sp..	Sp..	33x4	33x4		½E...	CAS..	S-W..	Ext...	Int...	R-W..		R.....	R...	R...	Climber Four..... K
Mun..	D-M..	Mun..	UnWE..	3	.....	Ad....	S-B...	.....	4.75	Sp..	Sp..	32x4½	32x4½		½E...	CAS..	Van..	Ext...	Int...	R-W..		R.....	R...	R...	Climber Six..... 5
Nor..	Cone..	Nor..	UnWE..	3	Met...	Col...	S-B...	F...	.....	Sp..	Sp..	33x5	33x5	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W	B.....	R.....	R...	R...	Cole..... 880
B&B..	Pla...	Dur...	UnWE..	3	Met...	Tim...	S-B...	½	.....	TA.	Sp..	32x4	32x4		Ca...	Gem..	S-W..	Ext...	Int...	R-W					Columbia..... CC
B&B..	Pla...	Mun..	UnWE..	3	Met...	Col...	S-B...	¾	.....	Sp..	Sp..	33x4½	33x4½	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W..					Comet..... 6-C53-2
B-L..	D-M..	B-L...	UnWE..	3	.....	Tim...	S-B...	½	.....	Sp..	....	32x4	32x4	Art...	½E...	Lav...	S-W..				R.....	R.....	R...	R...	Crawford..... 22-6-40
B&B..	Pla...	Mun..	UnWE..	.....	Fab...	Per...	S-B...	F...	4.25	....	Sp..	33x4	33x4	Art...	.....	Dit...	S-W..	Ext...	Int...	R-W.					Crow-Elkhart..... L
B&B..	Pla...	Mun..	.....	3	Fab...	Per...	S-B...	F...	4.25	....	Sp..	33x4	33x4	Art...	.....	Dit...	S-W..	Ext...	Int...						Crow-Elkhart..... S
B&B..	Pla...	Own..	UnWE..	4	Fab...	Tim...	S-B...	F...	4.22	TA.	Sp..	33x5	33x5		¾E...	Gem..	Wal..	Ext...	Int...						Cunningham..... V-4
B&B..	Pla...	Own..	UnWE..	4	Fab...	Tim...	S-B...	F...	4.22	TA.	Sp..	33x5	33x5		¾E...	Gem..	Wal..	Ext...	Int...						Cunningham.....
Own..	D-M..	Own..	UnWE..	.....	Met...	Tim...	S-B...	F...	.....	TA	.....	33x5	33x5	.....	½E...	Gem..	Wal..	Ext...	Int...	R-W..	.....	R.....	R...	R...	Daniels..... D-19
B&B..	Pla...	War..	UnWE..	3	Met...	Tim...	S-B...	¾	5.99	Sp..	Sp..	32x4	32x4	.....	½E...	War..	S-W..	Ext...	Int...						Davis..... 61-67
B&B..	Pla...	G-L...	UnWE..	3	Fab...	Per...	S-B...	F...	4.75	TT.	TT.	32x4	32x4	Art...	¾E...	CAS..	Van..	Ext...	Int...	R-W	B.....	R.....	R...	R...	Dixie Flyer..... H
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	F...	4.16	TT.	Sp..	32x4	32x4		¾E...	Own..	J-M..	Ext...	Int...	R-W					Dodge Brothers.....
Own..	D-M..	War..	UnWE..	3	Met...	Tim...	S-B...	¾	.....	Sp..	Sp..	33x5	33x5	Art...	½E...	Ross..	Van..	Ext...		R-W	B.....	R.....	R...	R...	Dorris..... 6-80
Det..	D-M..	Own..	UnWE..	3	Met...	Fli...	S-B...	¾	4.45	TT.	Sp..	31x4	31x4		FC...	Jac...	S-W..	Ext...	Int...	R-W	B.....	R.....	R...	R...	Dort..... 19
Hoo...	Pla...	Mec..	UnWE..	3	Met...	Own..	S-B...	¾	4.75	TT.	TT.	30x3½	30x3½	Wir...	FC...	CAS..	S-W..	Ext...	Int...	R-W					Driggs..... 1922
B-L...	D-M..	Own..	UnWE..	3	Fab...	Own..	S-B...	½	4.60	TT.	....	33x5	33x5	Wir...	½E...	Ross..	S-W..	Int...	Ext...	FRD.					Duesenberg..... Straight 8
B-L...	D-M..	B-L...	UnWE..	4	.....	Col...	S-B...	F...	.....	Sp..	....	32x4½	32x4½		½E...	Jac...	S-W..				R.....	R.....	R...	R...	Du Pont..... A
Own..	Pla...	.....	SepUn..	3	.....	Ad....	S-B...	¾	4.30	Sp..	Sp..	31x4	31x4	Art...	½E...	War..	S-W..	Ext...	Int...	R-W					Durant Four..... A-22
.....	Pla...	.....	SepUn..	3	.....	Tim...	S-B...	½	.....	.....	.....	32x4½	32x4½	Art...	½E...	.....	.....	Ext...	Int...	R-W	R.....	R.....	R...	R...	Durant Six..... B-22
B&B..	Pla...	Own..	UnWE..	3	Fab...	Own..	S-B...	½	3.66	Sp..	Sp..	32x4	32x4	Art...	½E...	CAS..	S-W..	Ext...	.....	.....	B.....	R.....	R...	R...	Earl..... 40
B&B..	Pla...	Mun..	UnWE..	3	Met...	Sal...	S-B...	¾	4.75	Sp..	Sp..	33x4	33x4	.....	½E...	Fos...	S-W..	Ext...	Int...	R-W	B.....	B.....	R...	R...	Elcar..... K-4
War..	D-M..	War..	UnWE..	3	Met...	Sal...	S-B...	¾	4.50	Sp..	Sp..	32x4	32x4	.....	½E...	Gem..	S-W..	Ext...	Int...	R-W	B.....	B.....	R...	R...	Elcar..... 7-R
.....	Pla...	.....	UnWE..	3	Met...	Col...	S-B...	¾	.....	TA.	Sp..	33x4	33x4		Ca...	CAS..	Van..	Ext...	Int...	R-W	B.....	B.....	R...	R...	Elgin..... K-7
Own..	DM..	Own..	UnWE..	3	Met...	Tim...	S-B...	½	4.66	Sp..	Sp..	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W	R.....	R.....	R...	R...	Essex.....
B&B..	Pla...	G-L...	UnWE..	3	Met...	Fli...	S-B...	½	4.88	Sp..	Sp..	32x4	32x4	.....	½E...	CAS..	S-W..	Ext...	Int...						Falcon Light Four.....
B&B..	Pla...	G-L...	UnWE..	3	Met...	Fli...	S-B...	½	4.88	Sp..	Sp..	32x4	32x4		½E...	CAS..	S-W..	Ext...	Int...						Falcon Six.....
Own..	D-M..	Own..	SepUn..	3	.....	.....	Own..	S-B...	¾	.....	Sp..	27x3½	27x3½	Wir...	½E...	Own..	S-W..	Int...	Int...						Falcon..... 12-D-22
.....	.....	.....	UnWE..	.....	Met...	Col...	S-B...	¾	.....	TA.	Sp..	32x4½	32x4½	Dis...	½E...	Gem..	S-W..	Ext...	Int...	R-W					Ferris..... 60
.....	.....	.....	UnWE..	.....	Met...	Col...	S-B...	¾	.....	TA	Sp..	32x4½	32x4½	St...	½E...	Gem..	S-W..	Ext...	Int...	R-W					Ferris..... 70
Own..	D-M..	Own..	UnWE..	2	Met...	Own..	StB...	½	3.63	TT.	....	30x3½	30x3½	Art...	T½...	Own..				D&R.		R.....	R...	R...	Ford..... T
B&B..	Pla...			3		Own..						32x4½	32x4½		½E...	Ross..			Int...	R-W					Fox.....
B&B..	Pla...	Own..	SepUn..	3	Met...	Own..	S-B...	½	4.33	Sp..	Sp..	32x4	32x4	Art...	El...	Own..	S-W..	Ext...	Ext...	D&R.	B.....	B.....	B...	B...	Franklin..... 9-B
.....	Pla...	.....	.....	.....	.....	Own..	.....	¾	.....	.....	.....	32x4	32x4	.....	½E...	.....	.....	.....	.....	.....	.....	.....	.....	.....	Frontenac.....
B&B..	Pla...	Mec..	UnWE..	3	Met...	Fli...	S-B...	¾	4.44	Sp..	Sp..	32x3½	32x3½	Art...	½E...	Dit...	S-W..	Ext...	Int...	R-W	B.....	R.....	R...	R...	Gardner..... R.T.S.
B&B..	Pla...	Dur...	UnWE..	.....	Met...	Col...	S-B...	¾	4.60	Sp..	Sp..	32x4	32x4	Art...	½E...	Jac...	Van..	Ext...	Int...	R-W	B.....	R.....	R...	R...	Grant.....
G-L...	Pla...	G-L...	UnWE..	3	Fab...	Col...	S-B...	.....	4.00	TT.	Sp..	32x4½	32x4½	Wir...	FC...	Jon...	Wal..	Ext...	Int...	R-W	....	.....	.....	.....	Goodspeed.....
War..	D-M..	.....	UnWE..	3	Met...	Own..	S-B...	¾	.....	TT.	TT.	32x4½	32x4½	Wir...	½E...	.....	S-W..	Int...	Ext...	R-W	.....	.....	.....	.....	H. C. S..... Series 3
War..	D-M..	War..	UnWE..	3	Met...	Tim...	S-B...	½	4.90	Sp..	Sp..	32x4½	32x4½	.....	½E...	Gem..	Van..	Ext...	Int...						Handley-Knight..... B
B&B..	Pla...	Dt....	UnWE..	.....	.....	Tim...	S-B...	¾	4.66	Sp..	Sp..	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Int...						Hansen..... 60
B&B..	Pla...	G-L...	UnWE..	3	Met...	Col...	S-B...	¾	4.63	Sp..	Sp..	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W					Hatfield..... A-42
B&B..	Pla...	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.60	TA.	Sp..	34x4½	34x4½	Art...	½E...	Jac...	S-W..	Ext...	Int...	R-W	B.....	B.....	R...	R...	Haynes..... 75
B&B..	Pla...	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.11	Sp..	Sp..	33x4	33x4	Art...	½E...	Jac...	S-W..	Int...	Int...	R-W	B.....	B.....	R...	R...	Haynes..... 55
B-L...	D-M..	B-L...	UnWE..	3	Met...	Tim...	S-B...	½	.....	Sp..	Sp..	34x4½	34x4½	Art...	El...	Gem..	S-W..	Ext...	Int...	D&R.	B&R.	R.....	R...	R...	Holmes..... Series 4
Own..	D-M..	Own..	UnWE..	3	Met...	Tim...	S-B...	½	4.81	Sp..	Sp..	34x4½	34x4½	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W	R.....	R.....	R...	R...	Hudson Super-Six.....
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.87	Sp..	Sp..	32x4	32x4	Art...	½E...	Jac...	S-W..	Ext...	Int...	R-W		R.....	R...	R...	Hupmobile..... R

Spa—Spacke.
Tim—Timken.
U. S.—U. S. Axle Co.
W-M—Weston-Mott.

Clutch Make:
Ans—Ansted.
B & B—Borg & Beck.
B-L—Brown-Lipe.
Det—Detlaff.
Dt—Detroit.
Doo—Dooley.
Ful—Fuller.
G-L—Grant-Lees.
Hoo—Hoosier.
Mun—Muncie.
M & E—Merchant & Evans.
Nor—Northway.
War—Warner.

Gearset Make:
B-L—Brown-Lipe.
Cov—Covert.
Dun—Dundore.
Dur—Durston.
Dt—Detroit.
Ful—Fuller.
G-L—Grant-Lees.
Hoo—Hoosier.
Mec—Mechanics.
Mun—Muncie.
Nor—Northway.
War—Warner.

Final Drive:
Bev—Bevel.
S-B—Spiral Bevel.
StB—Straight Bevel.

Propulsion Taken:
R R—Radius Rods.
Sp—Springs.
TT—Torque Tube.

Gearset Location:
Amid—Amidships.
Sep-Un—Separate Unit.
Un-W-E—Unit with Engine.
Un-TT—Unit with Torque Tube.

Universal Joints:
Fab—Fabric.
Lea—Leather.
Met—Metal.

Rear Axle Type:
F—Floating.
¾—¾ Floating.
½—Semi-Floating.

Torque Taken:
Sp—Springs.
TA—Torque Arm.
TT—Torque Tube.

RUNNING GEAR

Wheels:
Art—Artillery.
Dis—Disk.
St—Steel.
Wir—Wire.

Speedometer Make:
J-M—Johns-Manville.
S-W—Stewart-Warner.
Van—Van Sicklen.
Wal—Waltham.

Rear Springs:
Ca—Cantilever.
El—Elliptic.
½ E—Semi-Elliptic.
¾ E—Three-quarter Elliptic.
FuC—Full Cantilever.
FC—Floating Cantilever.
Pl—Platform.
T½—Transverse Semi-Elliptic.

Steering Gear Make.
Day—Dayton.
Dit—Ditweiler.
Fos—Foster.
Gem—Gemmer.
Jac—Jacox.
Jon—Jones.
Lav—Lavine.
War—Warner.
Woh—Wohlrab.

BRAKES

Type:
Ext—External.
Int—Internal.

Location:
D & R—Service on Drive Shaft, Emergency on Rear Wheels.
FRD—Service on Front and Rear Wheels, Emergency on Driveshaft.
R & D—Service on Rear Wheel, Emergency on Driveshaft.
R-W—Both Sets on Rear Wheel.

BEARINGS

B—Ball.
R & R—Ball and Roller.
R—Roller.

Passenger Car Chassis

Make and Model	Wheelbase	ENGINE											LUBRICATION		FUEL SYSTEM		IGNITION SYSTEM				
		Make	Number Cylinders, Bore and Stroke	Piston Displacement Cu. In.	Point Suspension	Cylinder Type	Cylinder Head	Cylinders Cast	Piston Material	Camshaft Drive	Cooling	Cooling Control	System	Type of Pump	Carbureter Make	Fuel Feed	Type	Make	Control	Generator Make	Voltage
Jackson 6-38	121	Con	6-3 1/4x4 1/2	224.0		L					Pump		Hol-Crk	Gear	Stromb	Vac	S-pt	Remy	Hand	Aut-L	6
Jordan MK	120	Own	6-3 1/8x4 3/4	245.6	3	L	Det.	6	CI	Chain	Pump	None	Hol-Crk	Gear	Stromb	Vac	Op-Cir	Delco	Hand	Delco	6
Jordan F	127	Con	6-3 1/2x5 1/4	303.1	3	L	Int	6	CI	Non-Met-G	Pump	None	Hol-Crk	Pist	Stromb	Vac	Op-Cir	Delco	Hand	Delco	6
King K	120	Own	8-3x5	282.7	3	L	Int	4	CI	Chain	Ther	None	Hol-Crk	Gear	B&B	Vac	Cl-Cir	At-K	Auto	West	6
Kissel 45	124	Own	6-3 3/8x5 1/2	284.4	3	L	Det.	6	CI	Non-Met-G	Pump	Ther	Cir-Spl	Gear	Stromb	Vac	Op-Cir*	Remy	Hand††	Remy	6
Kline Kar 6-55-K	121	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Rayfld	Vac	Cl-Cir**	Conn	Hand	Wagnr	6
Kurtz Automatic A	122	H-S	6-3 1/4x5	248.9	3	L	Det.	6	CI	Com-Gear	Pump	None		Gear	Zenith	Vac		West	Hand	West	
Lafayette 134	132	Own	8-3 1/4x5 1/4	261.3	4	L	Det.	4	CI	Chain	Pump	T&S	Hol-Crk	Gear	Johnsn	Pr	D-pt	Delco	Hand††	Delco	6
Leach 999	134	Own	6-3 3/4x5 1/4	347.9	3	H	Det.	6	CI		Pump	None	Hol-Crk	Gear	Rayfld	Vac	Op-Cir*	Delco	Hand	Delco	
Lexington T-22	128	Ans	6-3 1/4x4 1/2	224.0	3	H	Det.	6	CI	Non-Met-G	Pump	Ther	Hol-Crk	Gear	Rayfld	Vac	Op-Cir	Conn	Hand	G&D	6
Lexington ST-22	122	Ans	6-3 1/4x4 1/2	224.0	3	H	Det.	6	CI	Non-Met-G	Pump	Ther	Hol-Crk	Gear	Rayfld	Vac	Op-Cir	Conn	Hand	G&D	6
Liberty 10-D	117	Own	6-3 1/2x5	230.1	3	L	Det.	6	CI	Met-Gear	Ther		Hol-Crk	Gear	Stromb	Vac	Op-Cir	Wagnr	Hand	Wagnr	6
Lincoln	136	Own	8-3 3/8x5	357.8	3	L	Det.	4	CI	Chain	Pump	T&S	Hol-Crk	Gear	Stromb	Vac	Cl-Cir	Delco	Hand††	Delco	6
Locomobile 48	142	Own	6-4 1/2x5 1/2	524.8	4	L	Int	2	CI	Non-Met-G	Pump	None		Gear	B&B	Pr	D-pt	Berlg	Hand	West	6
Maibohm B	116	Falls	6-3 1/8x4 1/4	195.6	3	H	Det.	6	CI	Met-Gear	Ther	None	Cir-Spl	Pist	Tillot	Vac	Op-Cir*	At-K	Hand	Bijur	6
Marmon 34	136	Own	6-3 3/4x5 1/8	339.7	4	H	Det.	3	CI	Non-Met-G	Pump	None	Hol-Crk	Gear	Stromb	Gra		Delco	Hand††	Delco	6
Maxwell	109	Own	4-3 5/8x4 1/2	185.8			Det.	4	Al		Ther	None	Cir-Spl		Eagle	Gra					6
McFarlan TV	140	Own	6-4 1/2x6	572.5	4	T	Det.	3	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Rayfld	Vac		West	Hand	West	6
Mercer Series 5	132	Own	4-3 3/4x6 3/4	298.2	4	L	Int	4	CI	Chain	Pump	None		Gear		Vac	S-pt	Eisem	Hand	West	6
Merit BC	119	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None		Gear	Stromb	Vac	Cl-Cir	Delco	Hand	Delco	
Meteor 22-80	129	Due	4-4 1/2x6	340.4	3	H	Int	4	Al	Chain	Pump	None	Hol-Crk	Gear	Zenith	Vac	S-pt		Hand	West	
Mitchell F-50	120	Own	6-3 1/2x5	288.6	3	L	Det.	6	CI	Met-Gear	Pump	Ther	Cir-Spl	Pist	Stromb	Vac	S-pt	Remy	Hand	Remy	6
Mitchell F-50	127	Own	6-3 1/2x5	288.6	3	L	Det.	6	CI	Met-Gear	Pump	Ther	Cir-Spl	Pist	Stromb	Vac	S-pt	Remy	Hand	Remy	6
Monroe S-9-10-11-12	115	Own	4-3 1/4x4 1/4	149.3	3	H	Det.	4	Al	Met-Gear	Ther	None	Hol-Crk	Gear	Zenith	Vac	S-pt	Conn	Hand	Aut-L	6
Moon 6-48	122	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Rayfld	Vac	Op-Cir*	Delco	Auto	Delco	6
Moon 6-75	135	Con	6-3 5/8x5 1/4	325.1	3	L	Det.	6	CI	Chain	Pump	None	Hol-Crk	Gear	Rayfld	Vac	Op-Cir*	Delco	Auto	Delco	6
Murray-Mac 70-T	131	Ben	6-3 1/2x5 1/4	303.1	3	H	Det.	6	CI	Non-Met-G	Pump	Ther		Gear	Stromb	Vac		Dixie	Hand	Bijur	6
Nash 681-7	121	Own	6-3 1/4x5	248.9		H					Pump		Cir-Spl	Gear	Marvel	Vac		Wagnr	Hand††	Wagnr	6
Nash 682	127	Own	6-3 1/4x5	248.9		H					Pump		Cir-Spl	Gear	Marvel	Vac		Wagnr	Hand††	Wagnr	6
Nash 41-4	112	Own	4-3 3/8x5	178.9		H		4			Pump		Cir-Spl	Gear	Schebl	Vac		Delco	Hand	Delco	6
National Series BB	130	Own	6-3 1/2x5 1/4	303.1	3	H	Det.	6	CI	Chain	Pump	None	Hol-Crk	Gear	Rayfld	Vac	Cl-Cir	Delco	Auto	West	6
Noma 3-C	128	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Pist	Claudl	Vac	Op-Cir*	Delco	Hand	Delco	6
Noma 1-D	128	Bea	6-3 3/4x5 1/2	364.5	3	H	Det.	6	CI	Chain	Pump	None	Hol-Crk	Pist	Zenith	Vac	Op-Cir		Hand		6
Norwalk 4-30 KS	116	Lyc	4-3 1/2x5	192.4	3	H	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Pist	Zenith	Vac	Op-Cir	Delco	Hand	Dynet	6
Oakland 6-44	115	Own	6-2 11/16x4 3/4	177.0	3	H	Det.	6	Al	Chain	Pump	None	Hol-Crk	Gear	Marvel	Vac	Op-Cir	Remy	Hand††	Remy	6
Ogren Six	134	Con	6-3 5/8x5 1/4	325.1	3	L	Det.	6	CI	Chain	Pump	None	Cir-Spl	Gear	Rayfld	Vac	Op-Cir	Bosch	Hand	Bosch	6
Oldsmobile 43-A	115	Own	4-3 11/16x5 1/4	224.3	4	H	Det.	4	Al	Met-Gear	Pump	None	Cir-Spl	Gear	Zenith	Vac	S-pt	Remy	Hand	Aut-L	6
Oldsmobile 46	122	Own	8-2 1/8x4 3/4	246.7	3	L	Det.	4	CI	Com-Gear	Pump	None	Hol-Crk	Gear	B&B	Vac	D-pt	Delco	Auto	Delco	6
Oldsmobile 47	115	Own	8-2 7/16x4 1/2	233.7	3	L	Det.	4	CI	Non-Met-G	Pump	None	Hol-Crk	Gear	Johnsn	Vac	D-pt	Delco	Auto	Delco	6
Overland 4	100	Own	4-3 3/8x4	143.1		L					Ther		Cir-Spl		Tillot	Gra	S-pt	Conn	Hand	Aut-L	
Packard Single-Six	116	Own	6-3 3/4x4 1/2	241.6	3	L	Det.	6	CI	Chain	Pump	Ther	Hol-Crk	Gear	Own	Vac	D-pt	Delco	Hand††	At-K	6
Packard Twin-Six	136	Own	12-3x5	424.1	4	L	Det.	6	CI	Chain	Pump	Ther	Hol-Crk	Gear	Own	Pr	D-pt	Delco	Hand††	Bijur	6
Paige 6-44	119	Own	6-3 1/4x5	248.9	3	L	Det.	6	CI	Non-Met-G	Pump	None	Cir-Spl	Pist	Stromb	Vac	Cl-Cir*	At-K	Hand	Remy	6
Paige 6-66	131	Con	6-3 3/4x5	331.4	3	L	Det.	6	CI	Met-Gear	Pump	Ther	Hol-Crk	Gear	Rayfld	Vac	Cl-Cir*	At-K	Hand	Remy	6
Pan American 6-55	121	H-S	6-3 1/4x5	248.9	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Rayfld	Vac	Op-Cir	West	Hand	West	
Paterson 22-6-52	120	Con	6-3 3/4x4 1/2	298.2	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Stromb	Vac	Cl-Cir	Delco	Hand	Delco	6
Peerless 56 Series 7	125	Own	8-3 1/4x5	331.8	3	L	Int	4	CI	Non-Met-G	Pump	None	Hol-Crk	Gear	B&B	Vac	Cl-Cir	At-K	Hand	Aut-L	6
Piedmont 4-30	116	Lyc	4-3 1/2x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Pist	Carter	Vac	Op-Cir*	Delco	Hand	Dynet	6
Piedmont 6-40	122	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Com-Gear	Pump	None	Cir-Spl		Stromb	Vac	Op-Cir*	Remy	Hand	Remy	6
Pierce-Arrow 33	138	Own	6-4x5 1/2	414.7	4	D	Det.	6	Al	Met-Gear	Pump	Ther	Hol-Crk	Gear	Own	Pr		Delco	Hand	Delco	6
Pilot 6-50	126	H-S	6-3 1/4x5	248.9	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Tillot	Vac	Cl-Cir	Conn	Hand	Bijur	6
Porter 46	142	Own	4-4 3/8x6 3/4	478.4		H		4			Pump			Gear	Zenith	Pr		Berlg	Hand	West	12
Premier 6-D	126	Own	6-3 3/8x5 1/2	295.3	4	H	Det.	6	Al	Com-Gear	Pump	Ther	Hol-Crk	Gear	Johnsn	Vac		Delco	Hand	Delco	6
Premocar 6-40	117	Falls	6-3 1/8x4 1/4	195.6	3	H	Det.	6	CI	Met-Gear	Ther	None	Cir-Spl	Gear	Stromb	Vac	Op-Cir	Wagnr	Hand	Wagnr	
Ranger A-22-4	116	Own	4-3 3/8x5	178.9		L	Det.	4			Pump				Zenith	Vac		West		Bijur	
Ranger A-22-6	123	Own	6-3 5/8x5 1/4	325.1		H	Det.	6		Chain	Pump				Stromb	Vac		Philb		Bijur	
R. & V. Knight R	116	Own	4-3 3/4x5	220.9	3	S	Det.	4	CI	Chain	Ther	None	Hol-Crk	Gear	Stromb	Vac	S-pt	Wagnr	Hand	Wagnr	6
R. & V. Knight J	127	Own	6-3 1/4x4 1/2	259.8	3	S	Det.	6	CI	Chain	Ther	None	Hol-Crk	Gear	Stromb	Vac	S-pt	Wagnr	Hand	Wagnr	6
Reo T-6-B	120	Own	6-3 7/16x5	239.4	4	L†	Det.	6	Al	Met-Gear	Pump	None	Cir-Spl	Pist	Rayfld	Vac	Op-Cir*		Hand	N.E	6
ReVere	131	Due	4-4 1/4x6	283.7	3	H	Det.	4	Al	Chain	Pump	None		Gear	Stromb	Vac		Bosch	Hand	West	6
Rickenbacker A	117	Own	6-3 1/8x4 3/4	218.6	3	L	Det.	6	CI	Chain	Pump	None	Hol-Crk	Gear	Stromb	Vac	Cl-Cir	Aut-L	Auto	Simms	6
Roamer 4-75-E	128	R-D	4-4 1/4x6	340.4		Ho	Int	3	Al	Chain	Pump	None		Pist		Vac	Cl-Cir	Split	Hand	West	6
Roamer 6-54-E	128	Con	6-3 1/2x5 1/4	303.1		L	Int	6	CI	Met-Gear	Pump	None		Pist	Stromb	Vac	Cl-Cir	Bosch	Hand	Bijur	6
Rock Falls 14	132	Con	6-3 3/4x5	331.4	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Rayfld	Vac		Bosch	Hand	West	6
Rolls-Royce 1433	143	Own	6-4 1/2x4 3/4	453.3		L	Int	3	Al	Met-Gear	Pump		Hol-Crk	Gear	Own	Pr	Cl-Cir**	Own	Hand	Bijur	12
Romer A-22	120	Con	6-3 1/4x4 1/2	298.2	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Zenith	Vac		Conn	Hand	West	6
Saxon 125-G	112	Gray	4-3 1/2x5	192.3	3	H	Det.	4	CI	Chain	Ther	None		Gear	Stromb	Vac	Cl-Cir*	Wagnr	Hand	Wagnr	6
Sayers Six	119	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Hol-Crk	Gear	Stromb	Vac	Op-Cir	Delco	Hand	Delco	6
Seneca 50	112	Lyc	4-3 1/2x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Pist	Zenith	Vac	Op-Cir*	Aut-L	Hand	Aut-L	6
Standard Eight 11	127	Own	8-3 1/4x5	441.9	3	L	Int	4	CI	Non-Met-G	Pump	None	Hol-Crk	Gear	Zenith	Vac	S-pt	Split	Hand	West	6
Stanwood A-22	118	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Stromb	Vac	Cl-Cir	At-K	Hand	West	6
Stearns-Knight SKL4	125	Own	4-3 3/4x5 5/8	248.5	4	S	Det.	4	CI	Chain	Pump	None	Hol-Crk	Gear	Rayfld	Vac	Cl-Cir	At-K	Hand	West	12
Stephens 90	122	Own	6-3 3/4x4 1/2	224.0	3	H	Det.	6	CI	Non-Met-G	Ther	None	Hol-Crk	Gear	Tillot	Vac	Op-Cir	Conn	Hand	Aut-L	6
Stevens-Duryea E	138	Own	6-4 7/16x5 1/2	510.4	3	L	Int	2	CI	Non-Met-G	Pump	Ther	Cir-Spl	Gear	Stromb	Vac	Cl-Cir	Berlg	Hand	West	6
Studebaker Light Six	112	Own	6-3 1/4x4 1/2	207.1	3	L	Det.	6	CI	Chain	Pump	None	Cir-Spl	Gear	Stromb	Vac			Auto		
Studebaker Special Six	119	Own	6-3 1/2x5	288.6	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Stromb	Vac			Hand		
Studebaker Big Six	126	Own	6-3 7/8x5	353.8	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl	Gear	B&B	Vac			Hand		
Stutz K	130	Own	4-4 5/8x6	360.8	4		Int	4	CI	Met-Gear	Pump	None	Cir-Spl	Pist	Stromb	Pr	S-pt	Delco	Hand	Remy	6
Templar 445	118	Own	4-3 5/8x5 1/2	196.8	4	H	Det.	4	CI	Chain	Pump	None	Hol-Crk	Gear	Stromb	Vac		Simms	Hand	Bijur	6
Tulsa E-1-2-3	117	H-S	4-3 1/2x5	192.4	3	L	Det.	4	CI	Met-Gear	Ther	None	Cir-Spl	Gear	Zenith	Vac	D-pt	Conn	Hand	Dynet	6
Velie 58	115	Own	6-3 1/8x4 1/4	195.6	3	H	Det.	6	CI	Non-Met-G	Ther	None	Hol-Crk	Gear	Stromb	Vac	Cl-Cir	At-K	Hand	Bijur	
Velie 48	115	Con	6-3 1/4x4 1/2	224.0		L					Pump		Cir-Spl	Gear	Stromb	Vac		At-K	Hand††	Bijur	6
Velie 34	112	Falls	6-3 1/8x4 1/4	195.6		H					Ther		Cir-Spl	Gear	Stromb	Vac		At-K	Hand††	West	6
Vogue 6-55	124	H-S	6-3 1/4x5	248.9	3	L	Det.	6	CI	Met-Gear	Pump	None		Gear	Schebl	Vac	Cl-Cir**	Conn	Hand	Aut-L	
Vogue 6-66	124	Con	6-3 1/2x5 1/4	303.1	3	L	Int.	6	CI	Met-Gear	Pump	None	Cir-Spl	Econ	Schebl	Vac	Cl-Cir**	Conn	Hand	Aut-L	
Westcott A-44	120	Con	6-3 1/4x4 1/2	224.0	3	L	Det.	6	CI	Non-Met-G	Pump	None	Hol-Crk	Gear		Vac	Op-Cir*	Delco	Hand††	Delco	6
Westcott C-48	125	Con	6-3 1/2x5 1/4	303.1		L					Pump		Cir-Spl	Gear	Rayfld	Vac	S-pt	Delco	Hand††	Delco	6
Wills-Sainte Claire A-68	121	Own	8-3 1/4x4	265.4	4	H	Int.	4	CI	Met-Gear	Ther	None	Hol-Crk	Gear	Zenith	Vac	Op-Cir**	Delco	Hand††	Delco	6
Willys-Knight 20	118	Own	4-3 5/8x4 1/2	185.8	4	S	Det.	4	Al	Chain	Ther	None	Cir-Spl	Gear	Tillot	Vac	S-pt	Conn	Hand	Aut-L	6
Winther Six 61	120	H-S	6-3 1/4x5	248.9	3	L	Det.	6	CI	Met-Gear	Pump	None	Cir-Spl	Gear	Stromb	Vac	Op-Cir	West	Hand	West	6
Winton Six 25	132	Own	6-3 3/4x5 1/4	347.9				2			Pump	None			Stromb	Vac		Bosch	Hand	Bijur	6

For abbreviations, see pages 332 and 333.

Specifications—Continued

TRANSMISSION						REAR AXLE						TIRES					BRAKES			BEARINGS				
CLUTCH		GEARSET															TYPE							
Make	Type	Make	Location	Number Forward Speeds	Universal Joints Type	Rear Axle Make	Final Drive	Rear Axle Type	Direct Gear Ratio	Torque Taken By	Propulsion Taken By	Front	Rear	Wheels, Type	Type Rear Springs	Steering Gear Make	Speedometer Make	Service	Emergency	Location	Gearset	Rear Wheels	Front Wheels, Outer	Front Wheels, Inner	Make and Model
B&B..	Pla...	Cov...	UnWE..	3	.....	Sal...	S-B...	¾	4.75	Sp...	....	32x4½	32x4½	St....	½E...	Own..	.....	.....	.....	.....	B....	R....	R...	R..	Jackson 6-38
Dt....	Pla...	Dt...	UnWE..	3	Met...	Tim...	S-B...	½	4.42	Sp...	Sp...	32x4	32x4	.....	½E...	Gem..	S-W..	Ext...	Int...	R-W..	B....	R....	R...	R..	Jordan MX
Dt....	Pla...	Dt...	UnWE..	3	Met...	Tim...	StB...	½	4.80	Sp...	Sp...	32x4½	32x4½	.....	½E...	Gem..	S-W..	Ext...	Int...	R-W..	B....	R....	R...	R..	Jordan F
Dt....	Pla...	Own..	UnWE..	3	Fab...	Col...	S-B...	F...	....	TA.	Sp...	32x4½	32x4½	.....	FC...	Jac..	Van..	Ext...	Int...	.....	R....	R....	R...	R..	King K
War..	D-M..	War..	UnWE..	3	Met...	.....	S-B...	F...	....	Sp...	Sp...	32x4½	32x4½	Wir...	½E...	Jac..	S-W..	Ext...	Ext...	R-W..	.....	.....	.....	.....	Kissel 45
B&B..	Pla...	G-L..	UnWE..	3	Fab...	S-P...	S-B...	½	4.75	Sp...	Sp...	33x4	33x4	Art...	¾E...	Woh..	S-W..	Ext...	Int...	R-W..	B....	R....	R...	R..	Kline Kar 6-55-K
B&B..	Pla...	G-L..	UnWE..	3	Fab...	Sal...	S-B...	¾	4.50	Sp...	Sp...	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Kurtz Automatic A
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	F...	....	TT.	TT.	33x5	33x5	Art...	½E...	Own..	Wal..	Ext...	Int...	.....	R....	R....	R...	R..	Lafayette 134
.....	.....	Own..	UnWE..	3	.....	Tim...	S-B...	.....	....	TA.	TT.	32x4½	32x4½	Dis...	½E...	Gem..	.....	Int..	Ext..	R-W..	.....	.....	.....	.....	Leach 999
Ans..	D-M..	War..	UnWE..	3	Fab...	Own..	S-B...	¾	5.10	Sp...	Sp...	32x4½	32x4½	Art...	½E...	CAS..	S-W..	Ext...	Ext...	.....	.....	.....	.....	.....	Lexington T-22
Ans..	D-M..	War..	UnWE..	3	Fab...	Own..	S-B...	¾	5.10	Sp...	Sp...	32x4	32x4	Art...	½E...	CAS..	.....	Ext...	Ext...	.....	.....	.....	.....	.....	Lexington ST-22
B&B..	Pla...	Dt....	SepUn...	....	Met...	Tim...	S-B...	½	4.66	Sp...	Sp...	31x4	31x4	Art...	El....	Gem..	.....	Ext...	Ext...	.....	.....	.....	.....	.....	Liberty 19-D
Own..	D-M..	Own..	UnWE..	3	Met...	Tim...	S-B...	F...	....	TT.	TT.	33x5	33x5	Art...	½E...	Own..	.....	Ext...	Int...	R-W..	.....	.....	.....	.....	Lincoln
Own..	D-M..	Own..	SepUn...	4	Met...	Own..	S-B...	F...	....	TA.	RR.	35x5	35x5	Art...	¾E...	Own..	S-W..	Ext...	Int...	R-W..	B....	R....	R...	R..	Locomobile 48
B&B..	Pla...	Mun..	UnWE..	3	Fab...	Col...	S-B...	¾	5.00	Sp...	Sp...	32x4	32x4	.....	½E...	Dit..	S-W..	Ext...	Int...	.....	B....	.....	R...	R..	Maibohm B
Own..	D-M..	Own..	UnTT..	3	Met...	Own..	S-B...	¾	....	TT.	TT.	32x4½	32x4½	Wir...	T½..	Own..	Van..	Ext...	Int...	.....	R....	B....	R...	R..	Marmon 34
Own..	Cone.	Own..	UnWE..	3	.....	Own..	.....	¾	4.56	Sp...	RR.	31x4	31x4	.....	½E...	Own..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Maxwell
B&B..	Pla...	B-L..	SepUn...	3	Met...	Tim...	S-B...	F...	3.50	TA.	Sp...	33x5	33x5	.....	½E...	.....	S-W..	Ext...	Int...	R-W..	.....	.....	R...	R..	McFarlan TV
Own..	D-M..	Own..	SepUn...	4	Met...	Own..	S-B...	F...	3.87	Sp...	Sp...	32x4½	32x4½	.....	½E...	Gem..	S-W..	Int...	Int...	D&R..	.....	.....	R...	R..	Mercer Series 5
B&B..	Pla...	Mun..	UnWE..	3	Fab...	Col...	S-B...	F...	4.60	Sp...	Sp...	32x4	32x4	.....	½E...	Gem..	S-W..	Ext...	Int...	R-W..	.....	.....	R...	R..	Merit BC
B&B..	Pla...	Dun..	SepUn...	4	Met...	St-P...	S-B...	¾	....	Sp...	Sp...	32x4½	32x4½	Wir...	½E...	Gem..	S-W..	Int...	Int...	R&D..	B&R..	R....	R...	R..	Meteor 22-30
B&B..	Pla...	Own..	UnTT..	3	Met...	Own..	S-B...	F...	4.42	TT.	Sp...	33x4	33x4	Art...	FC...	Own..	S-W..	Ext...	Int...	R-W..	B&R..	R....	R...	R..	Mitchell F-50
B&B..	Pla...	Own..	UnTT..	3	Met...	Own..	S-B...	F...	4.42	TT.	Sp...	33x4	33x4	Art...	FC...	Own..	S-W..	Ext...	Int...	R-W..	B&R..	R....	R...	R..	Mitchell F-50
Own..	D-M..	Mec...	UnWE..	3	Met...	Own..	S-B...	¾	5.30	TA.	....	32x3½	32x3½	Art...	....	CAS..	S-W..	Ext...	Int...	R-W..	.....	R....	R...	R..	Monroe S-9-10-11-12
B&B..	Pla...	B-L..	UnWE..	....	Met...	Tim...	S-B...	½	4.66	Sp...	Sp...	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Moon 6-48
B&B..	Pla...	B-L..	.....	....	Met...	Tim...	S-B...	½	4.45	TA.	Sp...	32x4½	32x4½	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Moon 6-75
B-L..	D-M..	B-L..	UnWE..	4	Met...	Tim...	S-B...	F...	4.80	....	....	33x5	33x5	Art...	¾E...	Gem..	S-W..	Ext...	Ext...	R-W..	.....	.....	.....	.....	Murray-Mac 70-T
B&B..	Pla...	Own..	UnWE..	3	.....	.....	S-B...	½	4.50	Sp...	....	33x4	33x4	Art...	½E...	Gem..	S-W..	.....	.....	.....	R....	R....	R...	R..	Nash 681-7
B&B..	Pla...	Own..	UnWE..	3	.....	.....	S-B...	½	4.50	Sp...	....	34x4½	34x4½	Art...	½E...	Gem..	S-W..	.....	.....	.....	R....	R....	R...	R..	Nash 682
B&B..	Pla...	Own..	UnWE..	3	.....	Own..	S-B...	½	4.50	Sp...	....	33x4	33x4	Art...	½E...	Gem..	S-W..	.....	.....	.....	R....	R....	R...	R..	Nash 41-4
B&B..	Pla...	B-L..	UnWE..	3	Met...	Col...	S-B...	F...	4.08	TA.	Sp...	32x4½	32x4½	Art...	½E...	War..	S-W..	Ext...	Int...	R-W..	B&R..	R....	R...	R..	National Series BB
B&B..	Pla...	Dt....	UnWE..	3	Met...	Tim...	S-B...	½	4.45	Sp...	Sp...	32x4½	32x4½	Wir...	½E...	Lav..	S-W..	Ext...	Int...	.....	.....	.....	.....	.....	Noma 3-C
B&B..	Pla...	Dt....	UnWE..	3	Fab...	Tim...	S-B...	½	....	Sp...	Sp...	32x4½	32x4½	Wir...	½E...	Lav..	S-W..	Ext...	Int...	.....	.....	.....	.....	.....	Noma 1-D
B&B..	Pla...	G-L..	UnWE..	3	Met...	Col...	S-B...	¾	5.00	Sp...	Sp...	32x3½	32x3½	.....	½E...	Dit..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Norwalk 4-30 KS
Own..	Cone.	Hoo...	UnWE..	3	Met...	W-M..	S-B...	.....	4.66	Sp...	Sp...	32x4	32x4	Art...	½E...	Jac..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Oakland 6-44
B-L..	D-M..	B-L..	UnWE..	3	Met...	Col...	S-B...	F...	4.00	Sp...	Sp...	33x5	33x5	.....	½E...	Gem..	S-W..	Ext...	Int...	R-W..	B&R..	R....	R...	R..	Ogren Six
B&B..	Pla...	War..	UnWE..	3	Met...	Own..	S-B...	¾	4.66	TT.	Sp...	32x4	32x4	Art...	½E...	Jac..	S-W..	Ext...	Int...	R-W..	B&R..	R....	B...	B..	Oldsmobile 43-A
Own..	Cone.	War..	UnWE..	3	Met...	W-M..	S-B...	F...	4.93	Sp...	Sp...	32x3½	33x4½	.....	½E...	Jac..	S-W..	Ext...	Int...	R-W..	B&R..	B....	B...	B..	Oldsmobile 46
B&B..	Pla...	War..	UnWE..	3	Met...	Own..	S-B...	¾	5.10	TT.	Sp...	32x4	32x4	Art...	½E...	Jac..	S-W..	Ext...	Int...	R-W..	B&R..	R....	B...	B..	Oldsmobile 47
Own..	Pla...	Own..	UnWE..	3	.....	Own..	S-B...	¾	4.50	Sp...	....	30x3½	30x3½	Art...	Ca....	Own..	S-W..	.....	.....	.....	B&R..	B....	R...	R..	Overland 4
Own..	D-M..	Own..	UnWE..	3	Fab...	Own..	S-B...	½	4.30	TA.	....	33x4½	33x4½	Art...	½E...	Own..	S-W..	Ext...	Int...	R-W..	B&R..	B....	R...	R..	Packard Single-Six
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	½	4.36	TA.	....	35x5	35x5	Art...	½E...	Own..	Wal..	Ext...	Int...	R-W..	B....	B....	R...	R..	Packard Twin-Six
B&B..	Pla...	Own..	UnWE..	3	Met...	Sal...	S-B...	¾	4.75	Sp...	Sp...	32x4	32x4	.....	½E...	Jac..	S-W..	Ext...	Int...	R-W..	R....	B....	R...	R..	Paige 6-44
B&B..	Pla...	Own..	UnWE..	3	Met...	Sal...	S-B...	¾	4.55	Sp...	Sp...	32x4½	32x4½	.....	½E...	Jac..	S-W..	Ext...	Int...	R-W..	R....	B....	R...	R..	Paige 6-66
B&B..	Pla...	Dt....	UnWE..	3	Met...	Tim...	S-B...	½	4.90	Sp...	Sp...	33x4	33x4	.....	½E...	CAS..	S-W..	.....	.....	R-W..	B....	R....	R...	R..	Pan American 6-55
B&B..	Pla...	Dur..	UnWE..	3	Met...	StP...	S-B...	½	4.50	Sp...	Sp...	32x4½	32x4½	Art...	½E...	Jac..	S-W..	Ext...	Int...	.....	B....	B....	R...	R..	Paterson 22-6-52
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.90	Sp...	Sp...	33x4½	34x4½	Art...	Pl....	Gem..	Van..	Ext...	Int...	.....	B&R..	B&R..	R...	R..	Peerless 56 Series 7
B&B..	Pla...	G-L..	UnWE..	3	Fab...	Tim...	S-B...	½	....	Sp...	Sp...	32x3½	32x3½	Art...	½E...	Dit..	S-W..	Ext...	Ext...	R&D..	.....	.....	.....	.....	Piedmont 4-30
B&B..	Pla...	G-L..	UnWE..	....	Fab...	Spa...	S-B...	½	4.25	Sp...	Sp...	32x4	32x4	Art...	½E...	Lav..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Piedmont 6-40
Own..	D-M..	Own..	SepUn...	3	Met...	Own..	S-B...	½	....	TA.	Sp...	33x5	33x5	Art...	½E	Own..	Wal..	Ext...	Int...	R-W..	B....	B....	R...	R..	Pierce-Arrow 33
B&B..	Pla...	Mun..	UnWE..	3	Met...	Col...	S-B...	¾	5.00	Sp...	Sp...	32x4½	32x4½	.....	½E...	Dit..	S-W..	Ext...	Int...	R-W..	B....	B&R..	R...	R..	Pilot 6-50
Own..	Pla...	Own..	Amid...	4	.....	Own..	S-B...	F...	3.25	TA.	....	35x5	35x5	Art...	El....	Own..	S-W..	.....	.....	.....	B....	B....	B...	B..	Porter 46
B&B..	Pla...	Own..	UnWE..	3	Met...	.....	S-B...	½	....	Sp...	Sp...	32x4½	32x4½	Art...	½E...	Own..	S-W..	Ext...	Int...	R-W..	B....	.....	.....	.....	Premier 6-D
B&B..	Pla...	Mec...	UnWE..	....	Met...	.....	S-B...	½	....	Sp...	Sp...	32x4	32x4	.....	½E	Dit..	.....	Ext...	Int...	.....	.....	.....	.....	.....	Premocar 6-40
B&B..	Pla...	Dt....	UnWE..	3	.....	Col...	S-B...	¾	.....	.....	.....	32x4	32x4	Art...	½E...	Jac..	S-W..	.....	.....	.....	.....	.....	.....	.....	Ranger A-22-4
M&E	D-M..	Dt....	UnWE..	3	.....	Tim...	S-B...	¾	.....	.....	.....	33x4½	33x4½	Wir...	½E...	Day..	Wal..	.....	.....	.....	.....	.....	.....	.....	Ranger A-22-6
B&B..	Pla...	B-L..	UnWE..	3	Met...	Sal...	S-B...	F...	4.70	Sp...	Sp...	32x4	32x4	Art...	½E...	Jac..	S-W..	Ext...	Int...	R-W..	B&R..	B....	R...	R..	R. & V. Knight R
B&B..	Pla...	B-L..	UnWE..	3	Met...	Tim...	S-B...	½	4.90	Sp...	Sp...	32x4½	32x4½	Art...	½E...	Jac..	S-W..	Ext...	Int...	R-W..	B&R..	R....	R...	R..	R. & V. Knight J
Own..	D-M..	Own..	SepUn...	3	.....	.....	S-B...	½	4.70	Sp...	Sp...	33x4	33x4	Art...	½E...	Own..	.....	Ext...	Int...	.....	R....	R....	R...	R..	Reo T-6-B
B-L..	D-M..	B-L..	UnWE..	4	Met...	StP...	S-B...	¾	3.40	TT.	TT.	32x4½	32x4½	Wir...	¾E...	Gem..	S-W..	Ext...	Int...	R-W..	R....	R....	R...	R..	ReVere
Own..	Cone.	Own..	UnWE..	3	Met...	Own..	S-B...	¾	4.63	Sp...	Sp...	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Ext...	R&D..	.....	.....	.....	.....	Rickenbacker A
B-L..	D-M..	B-L..	UnWE..	4	Fab...	Tim...	S-B...	½	3.77	TT.	Sp...	32x4½	32x4½	Wir...	FuC..	Jac..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Roamer 4-75-E
B&B..	Pla...	G-L..	UnWE..	3	Fab...	Tim...	S-B...	.....	4.80	Sp...	Sp...	32x4½	32x4½	Wir...	FuC..	Jac..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Roamer 6-54-E
B&B..	Pla...	Dt....	UnWE..	3	Met...	Tim...	S-B...	F...	4.90	TA.	Sp...	35x5	35x5	Art...	¾E...	Gem..	S-W..	Ext...	Int...	.....	.....	.....	R...	R..	Rock Falls 14
Own..	Cone.	Own..	SepUn...	4	Met...	Own..	S-B...	F...	3.25	TT.	TT.	33x5	33x5	Wir...	FC...	Own..	Wal..	Int...	Int...	R-W..	B....	B....	B...	B..	Rolls-Royce
Ful...	D-M..	Ful...	UnWE..	3	Met...	Col...	StB...	F...	4.67	Sp...	Sp...	32x4	32x4	Art...	½E...	Gem..	S-W..	Ext...	Int...	.....	.....	.....	.....	.....	Romer A-22
Det...	Pla...	Cov...	UnWE..	3	Met...	.....	S-B...	¾	4.75	TA.	....	32x4	32x4	.....	.....	CAS..	S-W..	Ext...	Int...	R-W..	B&R..	.....	R...	R..	Saxon 125-G
B&B..	Pla...	G-L..	UnWE..	3	Met...	S-P...	S-B...	½	4.75	Sp...	Sp...	33x4	33x4	Art...	½E...	Lav..	S-W..	Ext...	Int...	R-W..	B&R..	R....	R...	R..	Sayers Six
B&B..	Pla...	G-L..	UnWE..	3	.....	.....	S-B...	F...	4.75	Sp...	Sp...	31x4	31x4	Art...	El....	Dit..	S-W..	Ext...	Int...	R-W..	.....	.....	.....	.....	Seneca 50
B&B..	Pla...	G-L..	UnWE..	3	Met...	Tim...	S-B...	½	4.45	Sp...	Sp...	34x4½	34x4½	Art...	½E...	Own..	S-W..	Ext...	Int...	R-W..	.....	R....	R...	R..	Standard Eight 11
B&B..	Pla...	G-L..	UnWE..	3	Met...	StP...	S-B...	½	4.50	Sp...	Sp...	33x4	33x4	Art...	½E...	Gem..	S-W..	Ext...	Int...	R-W..	.....	R....	R...	R..	Stanwood A-22
Own..	D-M..	Own..	UnWE..	3	Fab...	Own..	S-B...	½	4.50	TA.	Sp...	34x4½	34x4½	Art...	FC...	Own..	Van..	Ext...	Int...	.....	B&R..	R....	R...	R..	Stearns-Knight SKL4
B&B..	Pla...	Mec...	UnWE..	3	Met...	Tim...	S-B...	½	....	Sp...	Sp...	33x4½	33x4½	.....	.....	CAS..	S-W..	Ext...	Int...	R-W..	B....	.....	R...	R..	Stephens 90
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	F...	3.94	TT.	Sp...	35x5	35x5	Art...	¾E...	Own..	Wal..	Ext...	Int...	R-W..	.....	.....	.....	.....	Stevens-Duryea E
Own..	D-M..	Own..	Amid...	3	Fab...	Own..	S-B...	½	....	Sp...	Sp...	32x4	32x4	Art...	½E...	Own..	.....	Int...	Ext...	.....	.....	.....	.....	.....	Studebaker Light Six
Own..	D-M..	Own..	Amid...	3	Met...	Own..	S-B...	½	....	Sp...	Sp...	32x4	32x4	Art...	½E...	Own..	.....	Int...	Ext...	.....	.....	.....	.....	.....	Studebaker Special Six
Own..	D-M..	Own..	Amid...	3	Met...	Own..	S-B...	½	....	Sp...	Sp...	33x4½	33x4½	Art...	½E...	Own..	.....	Int...	Ext...	.....	.....	.....	.....	.....	Studebaker Big Six
War..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	½	....	TT.	TT.	32x4½	32x4½	.....	½E...	Gem..	S-W..	Int...	Int...	R-W..	B....	B....	R...	R..	Stutz K
B&B..	Pla...	Dt....	UnWE..	3	Fab...	U.S...	S-B...	½	4.40	Sp...	Sp...	32x4	32x4	.....	½E...	CAS..	S-W..	Int...	Int...	.....	.....	.....	.....	.....	Templar 445
B&B..	Pla...	Mun..	UnWE..	....	Met...	Sal...	S-B...	F...	4.50	Sp...	Sp...	33x4	33x4	.....	½E...	CAS..	S-W..	Ext...	Int...	.....	.....	.....	.....	.....	Tulsa E-1-2-3
Doo..	Pla...	Dur..	UnWE..	3	Met...	Tim...	S-B...	½	4.66	Sp...	Sp...	32x4	32x4	.....	½E...	Gem..	S-W..	Ext...	Int...	R-W..	B....	.....	R...	R..	Velie 58
B&B..	Pla...	Dur..	UnWE..	3	.....	Tim...	S-B...	½	4.60	Sp...	....	33x4½	33x4½	Art...	¾E...	Gem..	S-W..	.....	.....	.....	B&R..	R....	R...	R..	Velie 48
B&B..	Pla...	Dur..	UnWE..	3	.....	Col...	S-B...	¾	4.63	Sp...	....	33x4	33x4	Art...	½E...	Gem..	S-W..	.....	.....	.....	B....	B&R..	R...	R..	Velie 34
B&B..	Pla...	G-L..	UnWE..	3	Fab...	Sal...	S-B...	¾	4.50	Sp...	Sp...	32x4	32x4	.....	½E...	Dit..	S-W..	Ext...	Int...	.....	.....	.....	.....	.....	Vogue 6-55
B&B..	Pla...	G-L..	UnWE..	.....	Fab...	Sal...	S-B...	¾	4.50	Sp...	Sp...	32x4½	32x4½	.....	½E...	Dit..	S-W..	Ext...	Int...	.....	.....	.....	.....	.....	Vogue 6-66
B&B..	Pla...	War..	UnWE..	3	.....	Tim...	S-B...	½	4.66	Sp...	Sp...	32x4	32x4	Art...	½E...	Gem..	S-W..	.....	.....	R&D..	B&R..	R....	R...	R..	Westcott A-44
War..	D-M..	War..	UnWE..	3	.....	Tim...	S-B...	½	4.45	Sp...	....	32x4½	32x4½	Art...	½E...	Gem..	Van..	.....	.....	.....	B&R..	R....	R...	R..	Westcott C-48
Own..	D-M..	Own..	UnWE..	3	Met...	Own..	S-B...	½	....	TT.	Sp...	32x4½	32x4½	.....	½E...	Own..	Wal..	Ext...	Int...	R-W..	.....	.....	.....	.....	Wills Sainte Claire A-68
B&B..	Pla...	Own..	UnWE..	3	Fab...	Own..	S-B...	½	5.00	Sp...	....	33x4	33x4	Art...	½E...	Own..	S-W..	Ext...	Int...	R-W..	B&R..	R....	R...	R..	Willys-Knight 20
War..	D-M..	War..	UnWE..	3	Met...	Tim...	S-B...	½	4.45	Sp...	Sp...	32x4½	32x4½	Art...	½E...	Lav..	S-W..	Ext...	Ext...	R&D..	B&R..	R....	R...	R..	Winther Six 61
B-L..	D-M..	.....	.....	4	.....	.....	S-B...	F...	....	TA.	....	35x5	35x5	Art...	½E...	.....	.....	.....	.....	.....	R....	R....	R...	R..	Winton Six 25

For abbreviations, see pages 332 and 333.

American Passenger Car Design Trends

(*Continued from page* 330)

showing the variation from year to year in certain important elements of design. It should be understood that the figures used are arrived at by computing the percentage of chassis models which, according to the statistics given in the corresponding tabulation, employ the particular type of construction in question. These figures do not bear any relation to the quantity of cars produced which employ a given type of design. For example they show that nearly 90 per cent of the models listed employ the vacuum type of fuel feed, but Ford and some other large producers who together make much more than half of the total number of cars built each year use gravity feed fuel systems. The figures given do express in a sense the "votes" of the manufacturers in favor of a given construction, each maker being given one "vote" for each chassis model produced. When information is not furnished under a given head, the calculation covering this item is made on a basis which assumes that those not reporting are divided in the same proportion as those which report. In other words the figures express the percentage of "votes" cast which favor that construction.

The data on engine design factors show but little variation from the trend followed for several years past. The average bore and stroke, and consequently the bore-stroke ratio, have varied almost none since 1918. The percentage of four-cylinder models has decreased slightly this year, while the proportion of sixes has increased slightly as it has done for several years. The percentage of eights shows a slight increase after having fallen off steadily from a peak in 1916. Only one twelve remains.

There is a small gain in the percentage of L-head engines, which are used in 64.7 per cent of all models, and a somewhat larger gain in the proportion of valve-in-head types, while the proportion using the T-head type has decreased to less than one per cent.

So-called "full pressure" lubrication, in which oil is fed under pressure to the main bearings and thence through holes drilled in the crank cheeks to the crankpin bearings, continues to meet with favor and is now used on over 47 per cent of all models, as against 38.6 per cent last year. 52.6 per cent of models still use the ordinary circulating splash system, or a combination of pressure to main bearings and splash for all other parts.

Advocates of thermo-siphon cooling appear to have lost some ground this year in the passenger car as in some other fields, while pump circulation has gained accordingly. The more positive action of the pump is favored by some while the smaller radiator and water space required partly or wholly offset the extra cost of the pump. This trend, if it can be called such, is in keeping with a similar trend in truck and tractor construction.

Turning now to units for transmission of power to the wheels of the car we find that the trend away from the cone and toward the disk type continues. 94.2 per cent of models now have either single plate or multiple-disk types, nearly all of these being of the dry variety, while the cone clutch is now used on only 5.8 per cent of chassis models. In general the larger and more expensive cars use the multiple-disk type while the lighter and less expensive cars use the single plate type but there are exceptions in both classes. The models using the single plate type number 90, the multiple-disk type 57 and the cone type only 9.

Mounting the gearset as a unit with the engine, which last year was employed by 86.1 per cent of models, is used by a slightly larger proportion this year but the gain is much less than for many years past. This type of construction possesses certain advantages from a manufacturing and some other standpoints, but it is used in some cases at the expense of accessibility, especially as regards the clutch. Whether the lower rate of increase in this type is due to an appreciation of this fact remains to be seen. There is a slight decrease in the proportion of models in which a separate amidship mounting is used and a gain in the small number which use a mounting in unit with the torque tube, but the practice of mounting the gearset as a unit with the axle, where it increased unsprung weight, which was once done on 20 per cent of models is now entirely abandoned.

Spiral bevel final drives are rapidly approaching the point of universal application, having superseded all other types except the straight bevel, still used on 2.5 per cent of models. It was interesting to note how this distinctively American contribution to motor car construction has gained in favor even in England and continental Europe where it was once considered as more or less of a "freak." Its recognition is a tribute to American manufacturing methods as well as to our inventive genius, for both have contributed to its success.

Last year there was scarcely any difference in the relative popularity of full floating, three-quarter floating and semi-floating rear axles. The three-quarter floating type, which gained rapidly for five years after its introduction in 1912 has held second place since 1916. The relative standing this year is as follows: full floating 26.8 per cent, semi-floating 39.9 per cent, ¾ floating 33.3 per cent.

Fuel feed systems of the gravity and pressure type which once held the field alone, have now been nearly displaced by the vacuum type which shows a small gain over last year and is now used on about 90 per cent of all chassis models, 3.2 per cent still use gravity fuel feed, and 7.0 per cent employ the pressure type.

The small increase in average rated horsepower and in piston displacement, both of which are a function of the square of the bore and of the number of cylinders, is due largely to the increase in number of cylinders, for the average bore is about the same as it has been for several years.

Last year 133 models and 119 makes were listed. This year there are 159 models and 123 makes listed. The increase in number of manufacturers is somewhat surprising in view of the business depression and the excess capacity for car production. The greater number of models is due largely to the fact that many new chassis have been developed during the dull months while several older models are still listed. Many of the latter will doubtless be retained until obsolete, because of the investment in tools for making them is large and they must be used so long as the market can absorb the product.

The percentage of chain driven camshafts has increased from about 19 per cent last year to nearly 28 per cent this year, this gain being in line with efforts to render cars more quiet than formerly. Better methods for taking up slack due to chain wear or stretch are now used.

About 90 per cent of the chassis in which particulars concerning brake location have been furnished have both sets of brakes on the rear wheels, one set, usually the foot brakes, being of the contracting band type in most cases, and the other set internal expanding on the same drum. The remaining 10 per cent have one set of brakes on the rear wheels, these being foot operated, as a general rule, and the other set on the drive shaft, usually adjacent to the gearset. One car is now fitted with brakes on both front and rear wheels as well as on the drive shaft. Comparative figures for last year are not at hand, but there is thought to be a trend toward the use of drive shaft brakes. The average gear ratio is 4.53 and the average wheelbase 122 in., both figures being substantially the same as last year.

Export Specifications American Passenger Cars

NAME AND MODEL	Boxing Charge	Cubic Contents—Chassis Boxed	Cubic Feet—Complete Car Boxed	Magneto		Drive		Wheel Option				Color Options	Extra Charge	Tire Sizes	Rim Type	Tire Type
				Make	Extra Charge	Right-Hand	Extra Charge	Wire	Extra Charge	Disc	Extra Charge					
American, 6	$80	...	359	Bosch	75	Yes	$30	Yes	$100	Yes	$160	3 colors	None	610x105	S.S.	Cord
Anderson, "Coach-Bilt" 6	75	...	450	Bosch	35	Yes	...	Yes	100	Yes	150	Yes	None	33x4	S.S.	Cord
Apperson, Beverly	100	370	415			Yes	50	Yes	125	Yes	125	Yes	75	34x4½	S.S.	Cord
Auburn Beauty, 6-51	100	290	364	Bosch	55	Yes	None	Yes	100	No	None	Yes	50	33x3½	S.S.	Cord
Beggs	85	...	375		50	Yes	...	Yes	150	Yes	150	3 colors	None	880x120		Fabric
Buick, 22-35	55	152	314	Bosch	Yes	Yes	18	Yes	55	No	...	Black	...	31x4	S.S.	Cord
Buick, 22-49	70	169	314	Bosch	Yes	Yes	20	Yes	75	No	...	Blue or gray	No	880x120	C	Fabric
Buick, 22-45	65	163	334	Bosch	Yes	Yes	20	Yes	75	No	...	Green or gray	No	34x4½	S.S.	Cord
Cadillac, 61	125	250	418	None	...	Yes	90	Yes	Yes	Yes	Yes	Optional	Yes	33x5	S.S.	Cord
Champion Four	60	...	...	Optional	40	Yes	5	Yes	150	No	...	No	...	32x3½	S.S.	Fabric
Champion Special	60	...	...	Optional	40	Yes	5	Yes	150	No	...	No	...	32x3½	S.S.	Fabric
Chandler	75	338½	382	Bosch	None	Yes	None	Yes	Yes			Blue or green	No	33x4	S.S.	Cord
Chevrolet, 490	10	95	192	Berling	Yes	Yes	7	Yes	75	No	...	Black or green	Yes	30x3½	S.S.	Fabric
Chevrolet, F.B.	10	148	313	Simms	Yes	Yes	7	Yes	75	No	...	Black or green	Yes	33x4	C	Fabric
Climber Four	100	246	333		60	Yes	75	Yes	75	Yes	100	Any color	None	33x4	S.S.	Fabric
Climber Six	125	249	347	Bosch	None	Yes	75	Yes	75	Yes	100	Any color	None	32x4½	S.S.	Fabric
Cole 890	100	336	462		...	Yes	None	Yes	75	Yes	100	Any color	75	33x5	S.S.	Fabric
Columbia 6	70	225	340	Bosch	55	Yes	None	Yes	75	Yes	150	Any color	...	815x105	Opt.	Cord
Crow-Elkhart, 63-65	.....	...	335	Eisemann	85	Yes	...	Yes	100	Yes	150	0 color	None	32x3½	S.S.	Fabric
Crow-Elkhart, L63-65	.....	...	335	Eisemann	85	Yes	...	Yes	100	Yes	150	0 color	...	33x4	S.S.	Fabric
Cunningham	Yes	...	640	None	85	No	...	Yes	None	Yes	75	Optional	None	...		Cord
Davis, 61-67	100	...	390		...	Yes	None	Yes	125	Yes	125	3 colors	None	610x105	S.S.	Cord
Dixie-Flyer	63.91	210	304	Eisemann	...	Opt	...	Yes	120	Yes	165	3 colors	No	32x4	S.S.	Cord
Dodge Brothers	34	...	...	Simms	25	Yes	25		...	Yes	50	No	...	32x4	S.S.	Cord
Dorris, 6-80	125	...	...	Bosch	...	No	...	Yes	225	Yes	140	Yes	Yes	33x5	S.S.	Cord
Dort 19-14	.....	...	...	Bosch	...	Yes	None	Yes	Yes		...	No	...	31x4	S.S. or C	Fabric
Durant, 22	70	168	266	Simms	45	Yes	20	Yes	None		...	3 colors	None	31x4	S.S.	Fabric
Earl	50	...	350	Splitdorf	35	Yes	None	Yes	Yes		...	Green lake	...	32x4	S.S.	Cord
Elgin 6-K1	75	245	324	Bosch	50	Yes	35	Yes	50	Yes	50	Yes	50	33x4	S.S.	Fabric
Essex	Yes	318	318		50	Yes	...	Yes	Yes		...	2 colors	...	815x105	S.S.	Fabric
Ford	Yes	129	262		None	No	...	No	...	No	...		...	30x3½	C	Fabric
Franklin	85	...	389½	No	...	No	...	Yes	60	Yes	150	Yes	75	32x4	S.S.	Cord
Gardner	60	121	308	Bosch	40	Yes	35	No	...	Yes	35	No	...	32x3½	S.S.	Cord
Grant Six	80	290	344	Bosch	50	Yes	None	Yes	100		...		...	...		Cord
H. C. S.	None	...	330		...	No	...	Yes	...	No	None	5 colors	Yes	32x4½	S.S.	Fabric
Haynes 55	100	350	447	Simms	80	Yes	25	Yes	150	Yes	250	Yes	100	33x4	S.S.	Fabric
Haynes 75	100	380	486	Simms	80	Yes	25	Yes	150	Yes	250	Yes	100	34x4½	S.S.	Cord
Holmes 4	100	400	...	Eisemann	None	No	...	Yes	...	No	...	Blue	...	34x4½	S.S.	Cord
Hudson Super-6	Yes	370	393			Yes	...	Yes	Yes		...	2 colors	...	880x120	S.S.	Fabric
Huffman	70	322	373		...	Yes	None	Yes	135	No	...	3 colors	None	...	S.S.	Fabric
Hupmobile "R"	70	...	322	Splitdorf	...	Yes	...	Yes	100		...	2 colors	...	32x4	S.S.	Fabric
Jackson, 6	80	...	390	Bosch	35	Yes	25	Yes	100	Yes	100	5 colors	...	33x4	S.S.	Fabric
Jordan, MX	100	295	372	Bosch	50	Yes	50	Yes	90	Yes	115	3 colors	...	32x4	S.S.	Cord
Jordan, F	100	340	400	Bosch	50	No	...	Yes	90	Yes	115	2 colors	None	32x4½	S.S.	Cord
Kissel	110	404	466	Bosch	50	Yes	None	Yes	125	Yes	200	Green	100	32x4½	S.S.	Cord
Kline-Kar	90	250	350	Bosch	70	Yes	30	Yes	125	Yes	125	Yes	...	...	S.S.	Fabric
Lexington U	90	...	348	Liberty	50	Yes	None	Yes	75	Yes	75	3 colors	...	32x4½	S.S.	Cord
Liberty 6	75	246	280	Berling	65	Yes	35	Yes	100	Yes	100	5 colors	None	32x4	S.S.	Cord
Locomobile	125	...	485	Berling	None	No	...	Yes	275	Yes	300	18 colors	None	35x5	S.S.	Cord
Maibohm	110	181	314	Bosch	50	Yes	25	Yes	100	No	...	4 colors	...	815x120	S.S.	Cord
Marmom, 34	110	433	526	Simms	None	Yes	None	Yes	None	Yes	Yes	Any color	...	32x4½	S.S.	Cord
McFarlan	135	...	575	Berling	None	Yes	None	Yes	None	Yes	None	Any color	None	35x5	S.S.	Cord
Mercer	70	365	365	Eisemann	None	None	...	Yes	150	No	...	4 colors	None	32x4½	S.S.	Cord
Mitchell, F5-50	65	215	374	Bosch	75	Opt	No	Yes	80	No	...	2 colors	None	815x105	Opt.	Fabric
Mitchell, F7-50	70	264	396	Bosch	75	Opt	No	Yes	80	No	...	2 colors	None	815x120	Opt.	Fabric
Moller	.....	140	...	Eisemann	None	Yes	None	Yes	No	No	...		...	27x3½	C	Fabric
Moon 6-48	65	300	365	Bosch	35	Yes	None	Yes	75	Yes	90	2 colors	None	32x4	S.S.	Cord
Moon 6-40	60	275	315		...	Opt	None	Yes	75	No	75	Red or blue	None	31x4	Opt.	Cord
Nash, 691-7	60	...	...	Bosch	40	Opt	25	Yes	100	No	...	Gray or blue	...	875x105	Opt.	Cord
Nash, 692	60	...	...	Bosch	40	Opt	25	Yes	100	No	...	Gray or blue	...	880x120	Opt.	Cord
National BB	100	449	539	Bosch	...	No	...	Yes	...	Yes	...	No	...	32x4½	S.S.	Cord
Noma, 3C						Opt	...	Yes	...	No	...	Any color	50	880x120	S.S.	Cord
Oakland, 34-D	Yes	124	298	Liberty	Yes	Yes	Yes	Yes	Yes	No	...	Green or gray	No	32x4	S.S.	Fabric
Oldsmobile, 43-A	10	205	351		Yes	Yes	10	Yes	65	No	...	Blue or red	No	32x4	C	Fabric
Overland, 4	.....	108	272	Bosch	50	No	...	Yes	Yes	No	Yes	Green or blue	Yes	30x3½	C	Cord
Packard-Single-6	90	400	457	None	...	No	...	Yes	Yes	No	None	Any color	Yes	33x4½	S.S.	Cord
Packard-Twin-6	100	447	558	None	...	No	None	Yes	170	Yes	140	Any color	Yes	35x5	S.S.	
Paige 6-44	75	166	358	Bosch	45	Yes	None	Yes	94	Yes	116	Any color	35	32x4	S.S.	Cord
Paterson, 22-6-52	100	...	393		...	Yes	...	Yes	100	Yes	110	3 colors	No	32x4½	S.S.	Cord
Piedmont, 4-30	60	180	288	Splitdorf	50	Yes	10	Yes	100	No	None	Any color	25	32x3½	C	Fabric
Pierce-Arrow	130	437	527		...	No	None	Yes	115	Yes	90	Any color	No	33x5	S.S.	Cord
Pilot 6-65	90	...	406	None	...	Yes	None	Yes	105	Yes	...		...	32x4	S.S.	Fabric
Porter, 46	.....	...	...	Berling	None	Yes	None	Yes	280	No	...	Any color	None	35x5	S.S.	Cord
Premier, 6-D	90	325	396	None	...	Yes	150	Yes	125	Yes	170	3 colors	None	32x4½	S.S.	Cord
Reo, B-T6 & U-6	75	...	338			No	...	No	...	No	...	2 colors	None	33x4	S.S.	Cord
ReVere	85	...	384	Bosch	None	No	...	Yes	None	No	...	Any color	None	32x4½	S.S.	Cord
Roamer, 6-54-1	90	...	...	Bosch	None	Yes	25	Yes	None	Yes	75	Any color	None	820x120	S.S.	Opt
Rock Falls	250	...	...	Bosch	...	No	...		...	Yes	150	Any color	...	35x5	S.S.	Cord
Saxon-Duplex	75	277	276		45		25		...		...		...	32x4		
Sayers D.P.	90	...	350	Bosch	75	Yes	55	Yes	125	Yes	150	3 colors	30	33x4	S.S.	Fabric
Seneca, L & O	55	148	280	Simms	35	Yes	10	Yes	85	Yes	75	5 colors	...	30x3½	S.S.	Opt
Stephens, 90	90	...	410	Bosch	60	Yes	30	Yes	150		...	Red or blue	...	33x4½	S.S.	Cord
Stevens-Duryea, E	Yes	...	...	Berling	...	No	...	Yes	230		200	Opt	...	35x5	S.S.	Cord
Studebaker, L6 Light Six	Yes	...	268	Bosch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Gray or black	None	815x105	S.S.	Cord
Studebaker, B6 Big Six	Yes	...	347	Dixie	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Green	None	880x180	S.S.	Cord
Studebaker, S6 Special Six	Yes	...	331	Dixie	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Blue	None	815x105	S.S.	Cord
Stutz-Seis	125	...	444	Delco	...	Opt	...	Yes	None	No	...	Maroon, blue	...	32x4½	S.S.	Cord
Templar A-445	80	308	336	Simms	...	Yes	None	Yes	125	No	...	Black or red	...	660x115	S.S.	Cord
Velie, 58	65	185	376	Dixie	35	Opt	None	Yes	50	No	80	2 colors	None	32x4	S.S.	Cord
Vogue	100	...	360	Bosch	55	Yes	100	Yes	100	Yes	150	Green	...	32x4	S.S.	Fabric
Willys-Knight 20	51	315	331	Bosch	50	Yes	None	Yes	50	Yes	...		...	33x4	S.S.	Fabric
Wescott, C-38	110	...	388	Bosch	100	Yes	None	Yes	125	Yes	50	2 colors	50	33x4	S.S.	Cord
Westcott, C-48	110	...	413		...	No	...	Yes	175	No	200	2 colors	50	32x4½	S.S.	Cord
Winther-Seis	75	...	350	Bosch	...	Opt	150	Yes	...		...	Any dolor	...	33x4	S.S.	Cord
Winton 25 k	.....	425	520	Bosch	75	Yes	75	Yes	100	Yes	200	6 colors	Yes	35x5	S.S.	C od

Abbreviations—S.S.—Straight side. C—Clincher.

Design Tendencies in British Chassis

Light cars increase despite lack of public demand. Overhead valves gaining. Unit engine and gearset construction makes no headway, but unit torque tube and gearset shows gain. The percentage of four-cylinder engines is much greater than in American passenger car practice.

By M. W. Bourdon

AS will be gathered from the accompanying specification tables, an outstanding feature of the products of the British passenger car industry is the large number of chassis with four-cylinder engines termed 10 to 12 hp. and having a cylinder capacity of under 100 cu. in. The popularity of this type of chassis, which first gained force in 1919, has increased remarkably during the past twelve months.

Over 50 British manufacturers are interested in light cars of one size or another, and, although originally this type was almost monopolized by quite small manufacturers, some of the largest concerns have now entered the field.

British light cars are by no means cheap as regards first cost, for with a two-seated body and 10 hp. engine the average price is in the neighborhood of £400, or approximately $1,600 at normal rate of exchange. The average price of the 12 hp. type, which signifies an engine of 90 to 100 cu. in. capacity, is £600 (or $2,400) with a small four-passenger body. The popularity of the light car is therefore not due to its catalogue price, but rather to its low cost of running and upkeep in respect of fuel, tires, insurance and taxation, though there are not a few critics among British motorists who, as users of American cars of the Overland, Dodge and similar types, maintain that the difference in running costs between the low-priced American car and its small British contemporary does not justify the drawbacks attached to the lower powered and smaller vehicle. Be that as it may, there can be no question but that the light car in its various forms and sizes has secured a firm hold, and its introduction and development have created a demand but for which the British industry would at present be in a decidedly parlous state.

The full-sized four- and five-passenger car selling at a popular price has a very meager representation among the products of British automobile plants.

Chassis Design Features

Dealing with the features of chassis design of normally constituted passenger cars of all sizes, the four-cylinder engine maintains its popularity and is represented on 77 per cent of chassis, which is practically the same as 12 months ago. The actual number of six-cylinder engines has slightly increased, though in percentage of the total this type shows a falling off of 3 per cent due to the far larger number of two and four-cylinder models now in production. Eight per cent of the total have two-cylinder engines and 13 per cent six cylinders. Block cast cylinders comprise 72 per cent of the total, but include only two six-cylinder engines—the A. C. and the 40-hp. Napier—both having unit water jackets and top half of crankcase in aluminum with steel cylinder liners.

As regards valve arrangement, L-head cylinders are by far the most popular, occurring in 69 per cent of chassis, but overhead valves have gained slightly during the year and are now represented on 24 per cent of engines. The push-rod system of operation for valves in the head now has favor over the top camshaft, the positions as compared with last year being approximately reversed with push-rods now on 56 per cent. In a few cases the push-rods pass up through a passage formed in the cylinder block, but the majority of push-rods are exposed. With both overhead camshaft and push-rod operation it is usual to provide pressure lubrication for the overhead details, but in certain new models the simpler if less efficient system is embodied, namely, that of using the hollow rocker shaft to form an oil reservoir replenished by hand.

In water-cooled engines the pump and thermo-siphon circulation systems have approximately equal favor, but in 17 per cent of pump systems the pump is driven by belt and in such cases is usually located at the front end of the cylinder water jacket, the rotor being mounted on a rearward extension of the fan shaft.

Frame Suspension

Eighty-two per cent of British passenger car engines are supported directly in the main frame and 65 per cent of these have a 4-point suspension. Where sub frames occur, the majority (68 per cent) also have a 4-point support from the main frame, and in very few cases—either when the engine is suspended directly from the main frame or from a sub frame—is there any attempt to provide flexibility for the anchorages. The engine is, therefore, in the majority of cases called upon to assist in resisting frame distortion.

While the unit construction of engine and gearset has increased slightly, this feature occurs on only 28 per cent of cars, the majority (55 per cent) having the gearset amidships. There has, moreover, been a distinct increase in the number of gearsets mounted at the front end of the torque tube and a slight increase in the number arranged as a unit with the rear axle.

Reverting to the details of engine design, aluminum pistons have gained slightly, being now represented on 37 per cent of cars. Steel pistons appear in 2 per cent, the remainder being cast iron. Taking those of all materials, the straight-sided type of piston occurs in 88 per cent of cases, the slipper piston with segmental skirt having failed to increase in favor even when aluminum is used, in which event it would appear to have the greatest theoretical advantage.

In respect of engine lubrication, the pressure system in one form or another appears on 65 per cent of engines, which represents a small increase as compared with twelve months ago. Actually, however, the full pressure

system, in which the oil is conveyed by leads to the connecting rod small end, occurs in only 4 per cent of cases, while in 17 per cent the pressure feed is carried only to the main crankshaft journals, troughs occurring beneath the connecting rods to serve for the big-ends and splash to other interior details. The simple trough or circulating splash system with catch pits over the journals has decreased perceptibly in favor, now being used in only 23 per cent of engines.

British manufacturers generally do not favor the plunger type of oil pump, and it is used in only 19 per cent of cars, the gear type accounting for 76 per cent, while among the remainder the flywheel is used to lift the oil to gutters in one case and a disk on the crankshaft in another. Seventy-three per cent of pumps are located in the crankcase sump, 21 per cent at the rear end of the camshaft, and only 6 per cent at the side of the latter. It will be seen, therefore, that even when cam-operated plunger pumps are used the pump is generally located in the sump, despite the somewhat lengthy connecting rod which this arrangement implies. There is no improvement to record in regard to facilities for cleaning the oil filter, this operation in the majority of engines still involving the draining of the crankcase and the removal of the pump, for the filter usually consists of a dome or cylinder of gauze surrounding the pump intake.

The Zenith carbureter is by far the most popular device and actually appears on 55 per cent of British cars.

Gravity feed for the fuel is the most popular (53 per cent) and the vacuum system has made but slight headway during the past twelve months. It now appears on just over one-third the total number of British cars. Magneto ignition is still almost universal, appearing on 92 per cent of cars, on 6 per cent of which it is supplemented by a battery system, this combination being provided by some of the makers of super-grade chassis. It will thus be seen that the battery system as the sole means of ignition has by no means gained the favor of British manufacturers.

Three-bearing crankshafts predominate, this number being fitted to quite a good proportion of the smallest four-cylinder engines; but 27 per cent have only two bearings. There are very few examples of ball or roller journals or big-ends, and those that occur are mostly on two-cylinder engines. Three bearings are used for the majority of camshafts and half the total, irrespective of the number per shaft, are bronze bushes; white, metal-lined bushes are next in favor, but the practice of running the white metal into the crankcase housing is not in evidence; 7 per cent of camshaft bearings are of cast iron, either separate bushes or integral with a cast iron crankcase. For gearsets ball bearings are used in over 80 per cent on both shafts, with plain bushes occur for the pilot in 60 per cent, ball in 31 per cent and roller the remainder. Wheel bearings and those supporting the differential case are also mostly of the ball type (front wheels 60 per cent, rear 76 per cent, differential 86 per cent); where rollers occur they are usually of the Timken pattern.

Clutch Types

Cone clutches are still in the majority, being represented on 52 per cent of cars; the dry, single-plate type has, nevertheless, continued to gain slightly during the past year and is now found on 34 per cent, a gain of 6 per cent. Four out of ten cone clutches are of the inverted variety, usually with an internal central spring unprovided with adjustment. It need hardly be said that fabric friction material is generally used in cone and plate clutches, though 20 per cent of the former are leather-faced and two examples are metal-to-metal (aluminum cone to cast-iron flywheel) running in oil. Multi-plate clutches have slightly increased (12 to 14 per cent), but there is little doubt, however, that they will in the near future be displaced almost entirely by the dry, single-plate pattern.

As already mentioned, 55 per cent of gearsets are located amidships, separate from the engine. It may be added, however, that instead of three and four speeds being equally favored as last year, fours are now in the minority, represented by 46 per cent. On a percentage basis the central control lever has lost ground owing to the large number of new models having the lever on the right. Numerically, however, the central lever has gained and appears on 26 per cent of British cars.

The popularity of the fabric disk universal joint continues to increase, but it does not by any means show signs of entirely displacing metallic joints; it is used on the majority of clutch shafts, but one or other of the metallic types are still more usual on propeller shafts, the star type being favored at the front end and the pot or sliding block pattern at the rear in the case of open shafts.

Spiral Bevel Increases

Spiral bevel final drive has increased appreciably, now appearing on 63 per cent of cars, but it has displaced the straight bevel rather than the worm. Straight bevels have decreased from 28 per cent to 11.5 per cent, while worm drives above and below the axle to an almost equal extent appear on 21.5 per cent of chassis. Brakes on wheels only have also increased slightly in both number and percentage (61 to 64 per cent), but no four-wheeled British car in production has front wheel brakes.

Hollow pressed steel wheels with integral rims and formed of two pressings welded together continue to receive most favor, though they have receded from 56 to 51 per cent. Disk wheels have increased slightly (20 to 26 per cent), while wire-spoked remain as they were, being fitted to approximately 20 per cent of standard models. All wheels are detachable.

No British maker has yet adopted straight-side tires for a model in production, though at least two prominent firms will fit them in place of the beaded-edge or clincher variety before the next Olympia show. Of rear axles 50 per cent are full floating, the semi-floating variety occurring on 43 per cent of cars.

For 1922 a few makers have adopted the Marles cam steering gear as standard, but 54 per cent of cars have worm and worm wheel steering gears, 24 per cent worm and segment and 8 per cent worm and nut. The rest of the manufacturers use the epicyclic, rack and pinion or bevel patterns.

Assembled cars remain few and far between among the productions of British plants. Only some of the smallest concerns use stock engines and even they, in approximately 40 per cent of cases, make their own. Stock gearsets and back axles are quite exceptional. Even steering gears (apart from the Marles) are nearly always made by the car manufacturer—invariably so in other than quite the smallest of plants.

In regard to bodywork, the most favored type is still the open two, four or five passenger, though a dozen or so of makers now provide a modified folding top with side panels or curtains that open with the doors. There is but a very small demand for sedan bodies and coupes; both figure among the range of approximately 30 per cent of makers, but no maker looks upon any kind of body except the open type as the standard fitted to his chassis.

British Passenger Car

No. Car	MAKE AND MODEL	ENGINE AND COOLING SYSTEM												PISTONS		LUBRICATION		FUEL SYSTEM		ELECTRICAL SYSTEM		
		Nominal H. P.	Piston Displacement Cubic Inches	No. of Cyls.	Bore and Stroke, Ins.	Cylinder Head	Cylinders Cast	Cylinder Type	Overhead Valve Operation	Camshaft Drive	Cooling	Radiator Type	Point Suspension	Material	Type	System	Type of Pump	Make of Carbureter	Fuel Feed	Ignition	Generator Drive	Volts
1	A.B.C.	12	71.0	2	3 5/16x3 5/16	Det.	1	H.	P R.	St. Pin.	A.C.		4	C.I.	SS	Trough.	Plun.	Zenith	Gr.	Mag.	Belt	6
2	A.C.	11	93.7	4	2 3/4x3 5/16	Det.	4	L.		Ch.	Ther.	Tub.	3	Al.	SS	Hol-Crk.	Gear		Gr.	Mag.	Belt	6
3	A.C.	12	121.8	6	2 5/16x3 5/16	Det.	6	H.	C.	Ch.	Pump.	Tub.	3	Al.	SS	Hol-Crk.	Gear		Gr.	Mag.	Belt	6
4	Albert	12	90.8	4	2 5/16x4	Det.	4	H.	P.R.	Ch.	Ther.	Cel.	4	Al.	Spec.	Hol-Crk.	Gear	Claudl.	Gr.	Mag.	Pos.	12
5	Alvis	10	89.0	4	2 5/16x4 5/16	Int.	4	L.		Sk. Pin.	Ther.	Cel.	4	Al.	SS	Hol-Crk.	Gear	Solex	Gr.	Mag.	Belt	6
6	Angus Sanderson	14	141.4	4	3 x5	Det.	4	L.		Sk. Pin	Ther.			C.I.	SS	Hol-Crk.	Plun.	Zenith	Gr.	Mag.	Belt	12
7	Argyll	15	157.2	4	3 1/16x5 1/16	Det.	4	S.		Ch.	Pump.	Cel.	3	C.I.	SS	Hol-Crk.	Plun.	Zenith	Vac.	Mag.	Belt	12
8	Armstrong Siddeley.	18	147.0	6	2 3/4x4 1/16	Int.	3	H.	P.R.	Ch.	Pump.	Cel.	4	C.I.	SS	Hol-Crk.	Gear	Claudl.	Gr.	Mag.	Belt	12
9	Armstrong Siddeley.	30	303.1	6	3 1/16x5 1/4	Int.	3	H.	P.R.	Ch.	Pump.	Cel.	4	C.I.	SS	Hol-Crk.	Gear	Claudl.	Gr.	Mag.	Belt	12
10	Anel Johnston	16	157.2	4	3 1/16x5 1/16	Det.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Gear	Zenith	Vac.	Mag.	Pos.	6
11	Ashton Evans	11	72.5	4	2 5/16x4 5/16	Int.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Gear		Gr.	Mag.	Belt	6
12	Aston Martin	11	70.3	4	2 5/16x4 5/16	Int.	4	L.		Sk. Pin.	Pump.	Cel.	4	St.	Hr. Gl.	Hol-Crk.	Gear	W. & P.	Vac.	Mag.	Belt	12
13	Austin	12	99.4	4	2 5/16x4	Det.	4	L.		Ch.	Pump.	Cel.	3	Al.	SS	Hol-Crk.	Gear		Vac	Mag.	Pos.	6
14	Austin	20	220.9	4	3 1/4x5	Det.	4	L.		Ch.	Pump.	Cel.	3	Al.	SS	Hol-Crk.	Gear	Zenith	Vac	Mag	Belt	12
15	Bayliss Thomas	10	72.5	4	2 5/16x4 5/16	Int.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS		Gear	Cox	Gr.	Mag.	Pos.	6
16	Bean	12	112.9	4	2 3/4x4 3/4	Int.	4	L.		Sk. Pin	Ther.	Cel.	4	Al.	SS	Hol-Crk.	Gear		Gr.	Mag.	Belt	12
17	Beardmore [1]	11	102.1	4	2 11/16x4 1/2	Det.	4	H.	C.	Sk. Pin	Ther.	Tub.	3	C.I.	SS	Tr. & Pres	Gear	Zenith	Gr.	Mag.	Pos.	12
18	Belsize[2]	9	80.5	2	3 3/16x4 1/2	Det.	1	L.		Ch.	A.C.		4	C.I.	SS	Hol-Crk.	Gear	Zenith	Gr.	Mag.	Belt	6
19	Belsize	16	165.8	4	3 1/2x4 5/16	Int.	4	L.		Ch.	Pump.	Cel.	3	C.I.	SS	Hol-Crk.	Gear	Zenith	Vac.	Mag.	Belt	12
20	Bentley[2]	16	180.2	4	3 1/16x5 7/8	Int.	4	H.	C.	Sp. Bev.	Pump.	Cel.	3	Al.	Hr. Gl.	Hol-Crk.	Gear	Smith	Vac.	Mag.	Pos.	12
21	Blackburn	20	192.4	4	3 1/2x5	Det.	4	L.		Ch.	Pump.	Cel.	4	C.I.	SS	Hol-Crk.	Plun	Zenith	Vac	Mag	Belt	
22	Briton	9	84.6	4	2 1/2x4 5/16	Int.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Ecce.	Zenith	Gr.	Mag.	Belt	12
23	Briton	11	107.8	4	2 11/16x4 3/4	Int.	2	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Trough	Ecce.	Zenith	Gr.	Mag.	Belt	12
24	B. S.A.	9	64.9	2	3 1/2x3 5/16	Int.	1	H.	P. R.	St. Pin.	A.C.		4	Al.	SS	Splash	Gear	Zenith	Gr.	Mag.	Pos.	
25	Calcott	10	89.0	4	2 3/4x4 5/16	Int.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Trough.	Gear	Zenith	Gr.	Mag.	Pos.	8
26	Calcott	12	102.5	4	2 3/4x4 5/16	Int.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Trough.	Gear	Zenith	Gr.	Mag.	Pos.	12
27	Calthorpe	10	77.4	4	2 5/16x3 3/4	Int.	4	L.		Ch.	Ther.	Cel.	4	Al.	Slip	Tr. & Pres.	Plun.	Zenith	Gr.	Mag.	Belt	12
28	Charron Laycock	10	89.0	4	2 5/16x4 5/16	Det.	4	L.		Sk. Pin.	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Gear	Zenith	Vac	Mag.	Belt	6
29	Cluley	10	89.0	4	2 5/16x4 5/16	Int.	4	L.		St. Pin.	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Gear	Zenith	Gr.	Mag.	Pos.	12
30	Cluley	12	102.5	4	2 3/4x4 5/16	Int.	4	L.		St. Pin.	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Gear	Zenith	Gr.	Mag.	Pos.	12
31	Crossley	20	226.1	4	3 1/2x5 7/8	Det.	4	L.		Ch.	Pump.	Tub.	4	Al.	Hr. Gl.	Hol-Crk.	Gear	Smith	Vac	Mag.	Belt	12
32	Crossley	30	276.5	4	4 x5 1/2	Int.	2	L.		Ch.	Pump.	Tub.	3	C.I.	SS	Hol-Crk.	Gear	Smith	Vac	Mag.	Belt	12
33	Crouch	8	77.2	2	3 3/16x4 5/16	Det.	1	H.	P.R.	St. Pin.	Ther.	Tub.	3	Al.	SS	Hol-Crk.	Plun.	Cox	Gr.	Mag.	Belt	6
34	Cubitt	16	168.7	4	3 1/16x5 1/2	Det.	4	L.		Sk. Pin	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Plun	Smith.	Gr.	Bat.	Pos.	12
35	Daimler[1]	20	197.2	4	3 1/16x5 1/16	Det.	2	S.		Ch.	Pump.	Tub.	4	C.I.	SS	Tr. & Pres.	Plun	Own	Vac	Mag.	Belt	12
36	Daimler[1]	30	295.9	6	3 1/16x5 1/16	Det.	2	S.		Ch.	Pump.	Cel.	4	C.I.	SS	Tr. & Pres.	Plun	Own	Pr.	Mag.	Belt	12
37	Daimler[1]	45	449.2	6	4 5/16x5 1/8	Det.	2	S.		Ch.	Pump.	Tub	4	C.I.	SS	Tr. & Pres.	Plun	Own	Pr.	Mag.	Belt	12
38	Deemster	10	65.3	4	2 7/16x3 1/2	Int.	4	L.		St. Pin.	Ther.	Cel.	4	C.I.	SS	Trough.	Gear	Clandl	Gr.	Mag.	Belt	12
39	Enfield Allday	10	90.8	4	2 1/2x4 5/8	Int.	4	L.		Ch.	Ther.	Cel.	3	C.I.	SS	Hol-Crk.	Gear	Zenith	Vac	Mag.	Pos.	12
40	Ensign	38	414.7	6	4 x5 1/2	Det.	2	H.	C.	Worm	Pump.	Cel.	3	Al.	SS	Hol-Crk.	Gear	Zenith	Pr.	M & C.	Pos.	12
41	Galloway	10	89.0	4	2 5/16x4 3/16	Det.	4	L.		St. Pin.	Ther.	Cel.	3	C.I.	SS	Hol-Crk.	Gear	Zenith	Gr.	Mag.	Pos.	6
42	Guy	12	106.9	4	2 3/4x4 1/2	Det.	4	L.		St. Pin.	Ther.	Tub.	3	C.I.	SS	Trough.	Gear	Zenith	Gr.	Mag.	Belt	12
43	Guy	16	138.1	4	3 1/16x4 1/2	Det.	4	L.		St. Pin.	Ther.	Tub.	3	C.I.	SS	Trough.	Gear	Zenith	Gr.	Mag.	Belt	12
44	Guy	20	245.2	8	2 15/16x4 5/16	Det.	2	L.		Ch.	Pump.	Tub.	4	Al.	SS	Hol-Crk.	Gear	Smith	Vac.	Mag.	Pos.	12
45	G.W.K.	11	72.5	4	2 5/16x4 5/16	Det.	4	L.		Ch.	Ther.	Tub.	3	C.I.	Hr. Gl.	Trough.	Plun		Gr.	Mag.	Belt	6
46	Hampton	12	112.9	4	2 3/4x4 3/4	Det.	4	H.	P. R.	Ch.	Ther.	Cel.	3	C.I.	SS	Tr. & Pres.	Gear	Zenith	Vac.	Mag.	Belt	12
47	H.E.	14	128.8	4	2 5/16x4 3/4	Det.	4	L.		Ch.	Pump.	Cel.	4	C.I.	SS	Trough.	Gear	Zenith	Vac.	Mag.	Pos.	6
48	Hillman	11	98.0	4	2 5/16x4 3/4	Int.	4	L.		Sk. Pin	Ther.	Cel.	4	Al.	SS	Trough.	Gear	Zenith	Gr.	Mag.	Pos.	12
49	Horstmann	11	72.5	4	2 5/16x4 5/16	Int.	4	L.		Ch.	Ther.	Tub.	4	C.I.	SS	Hol-Crk.	Gear		Gr.	Mag.	Belt	
50	Humber	12	107.8	4	2 11/16x4 3/4	Det.	4	L.		Ch.	Ther.	Cel.	4	Al.	SS	Tr. & Pres.	Gear	Cox	Gr.	Mag.	Pos.	12
51	Humber	16	168.7	4	3 1/16x5 1/2	Int.	4	L.		Ch.	Pump.	Cel.	4	Al.	SS	Hol-Crk.	Gear	Cox	Vac	Mag.	Belt	12
52	Jowett	7	56.5	2	3 x4	Int.	1	L.		St. Pin.	Ther.	Tub.	3	C.I.	SS	Hol-Crk.	Gear	Zenith	Gr.	Mag.	Pos.	6
53	Lagonda	11	89.1	4	2 3/4x3 3/4	Int.	4	L.H.		Ch.	Ther.	Cel.	4	Al.	SS	Tr. & Pres.	Plun	Zenith	Gr.	Mag.	Belt	6
54	Lanchester	40	377.0	6	4 x5	Int.	3	H.	C.	Worm	Pump.	Cel.	4	Al.	SS	Full Pres.	Gear	S.U.	Vac.	M & B.	Pos.	12
55	Leyland		423.3	8	3 1/16x5 1/2	Det.	4	H.	C.	Ecce.	Pump.	Cel.	3	Al	Slip	Full Pres.	Gear	Smith	Vac.	Bat.	Pos.	12
56	Marlborough	11	93.7	4	2 3/4x3 5/16	Int.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Trough.	Gear	Solex	Gr.	Bat.	Belt	12
57	McKenzie	10	50.0	4	2 5/16x2 5/16	Int.	4	L.		Ch.	Ther.		4	C.I.	SS	Hol-Crk.	Gear	Cox	Gr.	Mag.	Belt	12
58	Morris	12	95.0	4	2 3/4x4	Det.	4	L.		Sk. Pin	Ther.	Tub.	4	C.I.	SS	Tr. & Pres.	Plun		Gr.	Mag.	Pos.	12
59	Napier	40	377.0	6	4 x5	Det.	6	H.	C.	Worm	Pump.	Cel.	4	Al.	SS	Hol-Crk.	Gear	Own	Pr.	M & B.	Pos.	12
60	New Orleans	10	77.2	4	2 1/2x3 5/16	Int.	4	L.		Sk. Pin	Ther.	Cel.	4	C.I.	SS	Tr. & Pres.	Gear	Own	Gr.	Mag.	Belt	6
61	New Orleans	15	112.9	4	2 3/4x4 3/4	Det.	4	L.		Sk. Pin	Pump.	Cel.	4	C.I	SS	Hol-Crk.	Gear	Own	Vac.	Mag.	Pos.	12
62	Orpington	10	93.3	4	2 5/16x4 5/16	Int.	4	L.		Ch.	Ther.	Cel.	4	C.I.	SS	Hol-Crk.	Gear	Zenith	Gr.	Mag.	Belt	6
63	Owen	30	318.5	8	2 15/16x5 7/8	Det.	4	L.		Sk. Pin	Pump.	Cel.	3	St.	SS	Full Pres.	Plun	Own	Vac.	M & B.	Pos.	12

ABBREVIATIONS:

Cylinder Head: **Det**—Detachable; **Int**—Integral.
Cylinder Type: **H**—Valves in Head; **S**—Sleeve; **T**—At Opposite Sides; **L**—Valves at Side; **LH**—Valves at Side, Exhaust Over Inlet.
Overhead Valve Operation: **P R**—Push Rods; **C**—Overhead Camshaft.
Camshaft Drive: **St Pin**—Straight Toothed Pinions; **Sk Pin**—Skew Toothed Pinions; **Ch-silent**—(inverted tooth) Chain; **Sp Bev**—Spiral Bevel; **Eccen**—Triple Eccentric Rods; **Sk & Wm**—Skew and Worm Gears; **Bev & Ch**—Bevel Gears and Silent Chain.
Cooling: **A-C**—Air-Cooled; **Ther**—Thermo Syphon.
Radiator Type: **Cel**—Cellular; **Tub**—Tubular.
Piston, Material: **C I**—Cast Iron; **Al**—Aluminum Alloy; **St**—Steel.
Piston, Type: **S S**—Straight Sided; **Hr Gl**—Hour Glass; **Slip**—Slipper (Segmental Skirt); **Spec**—Special.
Lubrication System: **Trough**—Troughs Under Connecting Rods and Catch Pits Over Main Bearings; **Tr & Pres**—Trough and Pressure, i.e. Troughs Under Connecting Rods and Direct Leads to Main Bearings; **Hol-Crk**—Drilled Crankshaft with Pressure Feed to Big-End and Main Bearings.
Type of Oil Pump: **Plun**—Plunger, Operated from Camshaft; **Gear**—Twin Gear Wheels; **Ecce**—Rotating Eccentric with Vane; **Flywh**—Flywheel Lifts Oil to Galleries and Troughs; **Disk**—Disk on Crankshaft Lifts Oil to Galleries and Troughs.
Carbureter Make: **Claudl**—Claudel, W & P, S.U.
Fuel Feed: **Gr**—Gravity; **Vac**—Vacuum; **Pr**—Pressure.
Ignition: **Mag**—Magneto; **M & B**—Magneto and Battery; **Bat**—Battery.
Generator Drive: **Pos**—Positive.
Bearings: **B & P**—Ball and Plain; **Pl**—Plain; **B & R**—Ball and Roller; **Bl**—Ball; **Rol**—Roller.

Chassis Specifications

TRANSMISSION AND OTHER CHASSIS PARTS																								CHASSIS DIMENSIONS				MAKE AND MODEL	No. Car
BEARINGS				Clutch	Gear Set				REAR AXLE					BRAKES						TIRES									
Gear Set														Hand		Foot													
Mainshaft	Lay Shaft	Front Wheels	Rear Axle	Type	Location	No. Forward Speeds	Steering Gear Type	Universal Joints, Type	Final Drive	Propulsion Taken By	Torque Taken By	Direct Gear Ratio	Type	Type	Location	Type	Location	Rear Springs, Type	Wheels, Type	Type	Size, Ins. or M.M.	Wheel Base, Ins.	Track, Ins.	Ground Clearance, Ins.	Weight of Chassis, Lbs.		
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W & Nut	Fab..	SB....	TT..	TT..	....	½..	Int..	RW..	Ext..	RW..	¼E..	Pr. St....	Cl..	710x90	100	47	8½	960	A.B.C.	1
Bl....	Bl....	Bl....	Bl....	D-P....	UA...	3	W & Wh.	Star..	WO...	TT..	TT..	4.5	Full..	Dsk..	PS...	Int..	RW..	¼E..	Disk....	Cl..	710x90	106	46	9	....	A.C.	2
Bl....	Bl....	Bl....	Bl....	D-P....	UA...	3	W & Wh.	Star..	WO...	TT..	TT..	4.5	Full..	Dsk..	PS...	Int..	RW..	¼E..	Disk....	Cl..	710x90	106	46	9	....	A.C.	3
Bl....	Pl....	Rol..	Bl....	D-P....	Amid..	4	W & Wh.	Fab..	StB...	TT..	TT..	4.5	Full..	Int..	RW..	Int..	RW..	Cant..	Pr. St....	Cl..	760x90	114	49	8½	1460	Albert	4
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W & Wh	Fab..	SB....	Sp....	Sp....	4.3	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	760x90	110	49	9	1350	Alvis	5
Bl....	Bl....	.....	.....	UE....	Star..	3	W & Wh	Star..	SB....	TT..	TT..	4.2	½..	Int..	RW..	Int..	RW..	Cant..	Pr. St....	Cl..	810x90	120	52	9	1900	Angus Sanderson	6
Bl....	Bl....	Rol..	Bl....	D-P....	UE....	4	W & Wh	Star..	SB....	TT..	TT..	4.3	Full..	Int..	RW..	Int..	RW..	ant..	Disk....	Cl..	820x120	120	53	8	2100	Argyll	7
Rol..	Pl....	Bl....	Bl....	D-M....	UT...	3	W & Wh	Star..	SB....	TT..	TT..	4.7	½..	Int..	RW..	Int..	RW..	ant..	Disk....	Cl..	815x105	120	51	8	2100	Armstrong Siddeley	8
Rol..	Pl....	Bl....	Bl....	D-M....	UT...	3	W & Wh	Star..	SB....	TT..	TT..	3.75	½..	Int..	RW..	Int..	RW..	Cant..	Disk....	Cl..	820x120	135	56	8½	2660	Armstrong Siddeley	9
Bl....	Bl....	Bl....	Bl....	D-P....	UE....	4	W & Seg	Ex. Pn	SB....	TT..	TT..	4.25	½..	Int..	RW..	Int..	RW..	½E..	Disk....	Cl..	815x105	120	56	8½	2490	Arol Johnston	10
Rol..	Bl....	B & R.	B & R.	Con....	Amid..	3	.....	Fab..	SB....	RR..	TA..	4	Full..	Int..	RW..	Int..	RW..	Trans.	Pr. St....	Cl..	650x65	96	48	8½	1000	Ashton Evans	11
Rol..	Rol..	Rol..	B & R.	MDO..	Amid..	4	Marles..	Star..	SB....	TT..	TT..	Opt.	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	710x90	103	48	8½	1140	Aston Martin	12
Bl....	Bl....	Bl....	Bl....	D-P....	UE....	4	W & Wh.	F & M	SB....	Sp....	Sp....	5.2	½..	Ext..	DS..	Int..	RW..	½E..	Wood....	Cl..	.....	112	48	9	1400	Austin	13
Bl....	Bl....	Rol..	B & R.	D-P....	UE....	4	W & Wh.	Pot..	SB....	Sp....	Sp....	3.9	½..	Ext..	DS..	Int..	RW..	½E..	Wood....	Cl..	820x120	130	56	9	2240	Austin	14
Pl....	Pl....	Rol..	Bl....	D-P....	Amid..	3	W & Seg.	Fab..	SB....	RR..	TA..	4.5	Full..	Int..	RW..	Int..	RW..	¼E..	Disk....	Cl..	700x80	99	55	9	....	Bayliss Thomas	15
Bl....	Pl....	Rol..	Bl....	Con....	Amid..	3	W & Seg.	S. & P.	SB....	Sp....	Sp....	4	½..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	760x90	102	49	9	1450	Bean	16
Bl....	Bl....	Rol..	Rol..	D-P....	UE....	4	W & Nut	Pot..	SB....	Sp....	Sp....	4.5	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	760x90	107	50	7½	1460	Beardmore[1]	17
Bl....	Pl....	Bl....	Bl....	MDO..	UE....	3	W & Nut	S & L.	SB....	Sp....	Sp....	4.25	N....	Int..	PS..	Int..	RW..	¼E..	Disk....	Cl..	700x80	99	46	8	1000	Belsize[3]	18
Bl....	Bl....	Bl....	Bl....	Con....	UE....	4	W & Wh.	Lea..	SB....	Sp....	Sp....	3.6	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	815x105	116	54	10	2350	Belsize	19
Bl....	Bl....	Rol..	B & R.	Con....	Amid..	4	W & Wh.	S & P.	SB....	Sp....	Sp....	3.7	½..	Int..	RW..	Int..	RW..	½E..	Wire....	Cl..	820x120	117	56	....	2300	Bentley[3]	20
Bl....	Bl....	Bl....	Bl....	UT....	4	W & Wh.	Star..	SB....	TT..	TT..	3.8	....	Int..	RW..	Int..	RW..	Cant..	Pr. St....	Cl..	815x120	129	56	8	2300	Blackburn	21
Bl....	Bl....	Bl....	Bl....	DM....	UE....	3	W & Wh.	Fab..	WO...	Sp....	Sp....	4.4	½..	Int..	RW..	Ext..	DS..	½E..	Disk....	Cl..	700x85	98	46	8½	1000	Briton	22
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	3	W & Wh.	Fab..	SB....	Sp....	Sp....	4.4	½..	Int..	RW..	Ext..	DS..	½E..	Pr. St....	Cl..	760x90	109	53	8	1220	Briton	23
Bl....	Bl....	Bl....	Bl....	D-P....	UE....	3	Rk & Pin	Star..	WU...	TT..	TT..	4.8	N....	Int..	RW..	Int..	RW..	¼E..	Disk....	Cl..	710x90	96	48	7½	....	B. S. A.	24
Bl....	Bl....	B & P.	B & P.	Con....	Amid..	3	W & Seg.	Fab..	SB....	Sp....	Sp....	4	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	700x80	93	45	9	1170	Calcott	25
Bl....	Bl....	B & P.	B & P.	Con....	Amid..	3	W & Seg.	Fab..	SB....	Sp....	Sp....	4	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	710x90	102	45	9	1570	Calcott	26
B & R.	Bl....	Bl....	Bl....	D-P....	Amid..	3	W & Seg.	Fab..	SB....	Sp....	Sp....	4.3	Full..	Int..	DS..	Int..	RW..	½E..	Pr. St....	Cl..	710x85	99	45	8½	930	Calthorpe	27
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	3	W & Wh.	Fab..	SB....	Sp....	Sp....	4.5	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	710x90	98	45	9	1350	Charron Laycock	28
.....	.....	Bl....	Bl....	Con....	UE....	3	W & Seg.	F & M	StB...	Sp....	Sp....	4.4	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	28x3½	96	45	7½	....	Cluley	29
.....	.....	Bl....	Bl....	Con....	Amid..	3	W & Seg.	F & M	StB...	Sp....	Sp....	4.4	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	28x3½	105	45	7½	....	Cluley	30
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W & Wh.	S & P.	SB....	Sp....	Sp....	3.57	½..	Int..	RW..	Ext..	DS..	½E..	Pr. St....	Cl..	820x120	124	55	9	2160	Crossley	31
Bl....	Bl....	Rol..	B. & R.	Con....	Amid..	4	W & Wh.	Star..	SB....	TT..	TT..	4	Full..	Int..	RW..	Int..	DS..	¾E..	Wire....	Cl..	920x120	135	54	10¾	....	Crossley	32
Bl....	Bl....	Bl....	Bl....	Con....	UT...	3	Rk & Pin	.....	SB....	TT..	TT..	4.5	N....	Int..	RW..	Int..	RW..	¼E..	Wire....	Cl..	710x90	114	45	6½	900	Crouch	33
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W & Wh.	Fab..	WO...	Sp....	Sp....	4.17	Full..	Int..	RW..	Ext..	DS..	½E..	Pr. St....	Cl..	815x105	126	54	10	2240	Cubitt	34
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W & Wh.	Star..	WU...	Sp....	Sp....	3.37	½..	Ext..	DS..	Int..	RW..	¾E..	Wire....	Cl..	880x120	132	57	9	2350	Daimler[1]	35
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W & Wh.	Star..	WU...	Sp....	Sp....	3.5	½..	Ext..	DS..	Ext..	RW..	¾E..	Wire....	Cl..	880x120	Var..	57	9	2890	Daimler[1]	36
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W & Wh.	Star..	WU...	Sp....	Sp....	3.5	½..	Ext..	DS..	Int..	RW..	¾E..	Wire....	Cl..	895x150	146	57	9	3320	Daimler[4]	37
Bl....	Bl....	Rol..	B. & R.	Con....	Amid..	3	W & Nut	Star..	StB...	TT..	TT..	4.5	Full..	Int..	RW..	Int..	RW..	¼E..	Pr. St....	Cl..	700x80	91	46	7½	750	Deemster	38
B. & R.	Rol..	Bl....	Bl....	Con....	Amid..	3	W & Wh.	Star..	SB....	TT..	TT..	4.75	½..	Ext..	DS..	Int..	RW..	Cant..	Pr. St....	Cl..	30x3½	108	48	9½	1620	Enfield Allday	39
Bl....	Bl....	Rol..	B. & R.	DM....	UE....	3	W & Wh.	Star..	SB....	TT..	TT..	3.6	Full..	Int..	RW..	Int..	RW..	Cant..	Wire....	Opt.	895x150	147	56	8½	3360	Ensign	40
Bl....	Bl....	Rol..	G. & R.	Con....	UE....	3	W & Seg.	Fab..	SB....	TT..	TT..	4.2	½..	Int..	RW..	Int..	RW..	¼E..	Disk....	Cl.	710x90	112	49	....	1350	Galloway	41
Bl....	Bl....	Rol..	B. & R.	Con....	UE....	3	W & Wh.	Fab..	SB....	Sp....	Sp....	.....	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	760x90	110	48	7½	....	Guy	42
Bl....	Bl....	Rol..	G. & R.	Con....	UE....	3	W & Wh.	Fab..	SB....	Sp....	Sp....	.....	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl..	815x105	114	54	9	....	Guy	43
Bl....	Bl....	Rol..	B. & R.	Con....	Amid..	4	W. & Wh.	S. & P.	SB....	Sp....	Sp....	4.01	Full..	Int..	RW..	Int..	RW..	½E..	Wire....	Cl..	820x120	130	56	9	2880	Guy	44
Bl....	Bl....	Bl....	Bl....	.....	FD...	F	Epicy...	.....	IG....	Sp....	Sp....	.....	.....	Int..	RW..	Int..	RW..	¼E..	Wire....	Cl..	700x 80	106	48	8	950	G.W.K.	45
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	3	W. & Seg.	Fab..	SB....	Sp....	TA..	4	Full..	Int..	RW..	Int..	RW..	¾E..	Pr. St....	Cl.	710x 90	108	48	9	1300	Hampton	46
Bl....	G. & R.	B. & R.	B. & R.	DM....	Amid..	4	W. & Nut	Star..	WO...	TT..	TT..	4.2	Full..	Int..	RW..	Int..	RW..	¾E..	Pr. St....	Cl.	815x105	114	50	10	2100	H.E.	47
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	3	W. & Seg.	Spec...	WO...	Sp....	Sp....	.....	½..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl.	700x 85	102	48	9	1570	Hillman	48
Bl....	Pl....	Rol..	Rol..	D-P....	UA...	3	Bev....	Star..	St. B.	TT..	TT..	4	½..	Int..	RW..	Int..	RW..	Cant..	.....	Cl.	700x 85	.....	.....	.....	.....	Horstmann	49
Bl....	Bl....	Bl....	Bl....	Con....	UE....	4	W. & Wh.	Fab..	St. B.	Sp....	Sp....	4.33	Full..	Ext..	RW..	Ext..	DS..	½E..	Pr. St....	Cl.	760x 90	105	55	8½	1280	Humber	50
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W. & Wh.	F. & M.	St. B.	Sp....	Sp....	4.33	Full..	Int..	RW..	Ext..	DS..	½E..	Pr. St....	Cl.	815x105	123	57	9	1770	Humber	51
Bl....	Bl....	Bl....	Bl....	Con....	UE....	3	Epic....	Fab..	SB....	Sp....	Sp....	4.5	½..	Ext..	RW..	Ext..	DS..	½E..	Pr. St....	Cl..	26x 3	84	45	8	670	Jowett	52
B. & P..	Pl....	Bl....	Bl....	Con....	UE....	3	W. & Seg.	Fab..	WO...	TT..	TT..	4.4	½..	Int..	RW..	Ext..	DS..	¼E..	Pr. St....	Cl.	700x 80	108	46	7	....	Lagonda	53
.....	.....	B & R.	B. & R.	D-P....	UE....	3	W. & Nut	Star..	WU...	TT..	TT..	.....	Full..	Int..	RW..	Int..	DS..	Cant..	Wire....	....	895x135	141	58	11	....	Lanchester	54
Rol..	Rol..	B & R.	B. & R.	D-P....	Amid..	4	Marles..	MD...	SB....	TT..	TT..	3.2	Full..	Int..	RW..	Int..	RW..	¼E..	Disk....	Cl.	895x135	141	56	.....	....	Leyland	55
Bl....	Bl....	Bl....	Bl....	MDO..	Amid..	4	W. & Seg.	Pot..	SB....	Sp....	Sp....	4	½..	Int..	RW..	Int..	RW..	½E..	Disk....	Cl.	710x 90	108	48	9	1120	Marlborough	56
.....	.....	Bl....	Bl....	Con....	Amid..	3	W. & Wh.	Fab..	SB....	Sp....	Sp....	4.2	Full..	Int..	RW..	Int..	RW..	½E..	Pr. St....	Cl.	700x 80	102	48	8	1120	McKenzie	57
Bl....	Pl....	Bl....	Bl....	MD....	UE....	3	W. & Wh.	Pot..	SB....	TT..	TT..	4.75	½..	Int..	RW..	Int..	RW..	¾E..	Pr. St....	Cl.	710x 90	102	48	....	1220	Morris	58
Rol..	Rol..	Rol..	Rol..	D-P....	Amid..	4	W. & Seg.	Star..	SB....	Sp....	TT..	3.7	½..	Int..	RW..	Ext..	DS..	Cant..	Wire....	Cl.	895x150	137	56	....	2890	Napier	59
Bl....	Bl....	Bl....	Bl....	D-P....	UA...	2	W. & Wh.	Fab..	SB....	TT..	TT..	4	Full..	Int..	RW..	Int..	RW..	½E..	Disk....	Cl.	710x 90	102	50	8¼	1000	New Orleans	60
Bl....	Bl....	Bl....	Bl....	D-P....	UE....	4	W. & Wh.	Star..	SB....	TT..	TT..	3.25	Full..	Int..	RW..	Int..	RW..	½E..	Disk....	Cl.	820x120	129	56	9	1280	New Orleans	61
Bl....	Bl....	Rol..	Rol..	Con....	Amid..	3	W. & Wh.	Fab..	St. B.	Sp....	Sp....	4.2	N....	Int..	RW..	Ext..	DS..	¼E..	Pr. St....	Cl.	710x 90	96	50	7½	1460	Orpington	62
Bl....	Bl....	Rol..	Rol..	Con....	UA...	6	W. & Wh.	Star..	SB....	TT..	TT..	3	Full..	Int..	RW..	Int..	RW..	Cant..	Pr. St....	Cl.	895x135	160	60	9	2460	Owen	63

Clutch Type: **D P**—Dry Single Plate; **O P**—Single Plate in Oil: **Con**—Cone; **M D O**—Multiple Disk in Oil; **D M**—Dry Multiple Disk.

Gearset Location: **Amid**—Amidship; **U E**—Unit with Engine; **U A**—Unit with Axle; **U T**—Unit with Torque Tube; **F D**—Friction Drive.

Steering Gear Type: **W & Wh**—Worm and Full Worm Wheel; **W & Seg**—Worm and Worm Wheel Segment; **W & Nut**—Worm and Nut; **Rk & Pin**—Rack and Pinion; **Epicy**—Epicyclic; **Marles**—Marles Cam Gear.

Universal Joints: **Fab**—Fabric Disk; **S & P**—Star and Pot Type; **F & M**—Fabric Disk and Metal; **Pot**—Pot Type (metal); **Star**—Star Type (metal); **Lea**—Leather Disk; **S & L**—Star and Leather Disk; **M D**—Metal Disk.

Final Drive: **Wo**—Worm Over Axle; **Wu**—Worm Under Axle; **S B**—Spiral Bevel; **St B**—Straight Toothed Bevel; **I G**—Internal Gear.

Drive and Torque: **TT**—Torque Tube; **Sp**—Springs; **RR**—Radius Rods; **T A**—Torque Arm.

Rear Axle: **Full**—Full Floating; **½**—Semi-floating; **N**—Non-floating.

Brakes: **Int**—Internal Expanding Shoes; **Dsk**—Disk; **Ext**—External Contracting Shoes or Band; **R W**—On Rear Wheels; **P S**—On Pinion or Worm, Shaft, Front or Back or Axle Casing; **D S**—On Drive Shaft at Rear of Gearset.

Springs: **¼ E**—Quarter Elliptic; **½ E**—Semi-Elliptic; **¾ E**—Three-quarter Elliptic; **Trans**—Transverse Inverted Semi-Elliptic; **Cant**—Cantilever; **¾ Dul**—Two Super-imposed Quarter Elliptic; **C & ½ E**—Cantilever Fore and Aft Anchored to Semi-Elliptic Amidships, at Each Side of Chassis.

Wheels: **Pr St**—Hollow Spoked Pressed Steel with Integral Rim.

Tires: **Cl**—Clincher; **S S**—Straight Sided.

[1]Troughs Connected to Throttle.
[2]Four Valves Per Cyl.
[3]Oil Cooled Cylinders.

British Passenger Car Chassis

No.	Car	MAKE AND MODEL	ENGINE AND COOLING SYSTEM												PISTONS		LUBRICATION		FUEL SYSTEM		ELECTRICAL SYSTEM		
			Nominal H.P.	Piston Displacement Cubic Inches	No. of Cyls.	Bore and Stroke, Ins.	Cylinder Head	Cylinders Cast	Cylinder Type	Overhead Valve Operation	Camshaft Drive	Cooling	Radiator Type	Point Suspension	Material	Type	System	Type of Pump	Make of Carburetor	Fuel Feed	Ignition	Generator Drive	Volts
64	Palladium		12	93.3	4	2¾x3⅝	Det.	4	L.		Sk. Pin	Ther.	Cel.	3	C.I.	SS.	Trough.	Plun.	Zenith	Gr.	Mag.	Belt	6
65	Phoenix		12	93.3	4	2¾x3⅝	Int.	4	L.		Sk. Pin	Ther.	Tub.	4	C.I.	SS.	Tr. & Pres.	Gear	S.U.	Gr.	Mag.	Belt	6
66	Phoenix		18	190.1	4	3⅝x5½	Det.	4	H.	C.	Sk. Pin	Pump	Tub.		C.I.	Slip	Tr. & Pres.	Gear	Zenith	Vac.	Mag.	Belt	12
67	Rhode		9	65.3	4	2⅞x3½	Det.	4	H.	C.	Bev.	Ther.	Cel.	3	C.I.	SS.	Trough.	Flywh.	Cox	Gr.	Mag.	Pos.	6
68	Riley		11	72.5	4	2⅝x4⅝	Det.	4	L.		Ch.	Ther.	Cel.	4	Al.	Slip	Tr. & Pres.	Gear	Zephyr	Gr.	Mag.	Belt	12
69	Rolls Royce		40	453.3	6	4½x4¾	Int.	3	L.		Sk. Pin	Pump	Cel.	3	Al.	SS.	Full Pres.	Gear	Own	Pr.	M & B.	Belt	12
70	Rover		8	61.5	2	3⅜x3⅞	Det.	1	L.		St. Pin	A.C.		3	C.I.	SS.	Trough.	Ecce.	Smith	Gr.	Mag.	Belt	6
71	Rover		12	138.9	4	2⅞x5½	Det.	4	L.		Ch.	Pump	Cel.	4	C.I.	SS.	Trough.	Gear	Solex	Vac.	Mag.	Belt	12
72	Ruston Hornsby		16	157.2	4	3½x5½	Det.	4	L.		Sk. Pin	Pump	Cel.	3	C.I.	SS.	Tr. & Pres.	Gear	Zenith	Gr.	Mag.	Belt	12
73	Ruston Hornsby		20	226.4	4	3¾x5½	Int.	4	L.		Sk. Pin	Pump	Cel.	3	C.I.	SS.	Tr. & Pres.	Gear	Zenith	Gr.	Mag.	Belt	12
74	Sheffield Simplex		50	477.1	6	4¼x5	Int.	1	L.		Ch.	Pump	Tub.		Al.	Trnk	Hol-Crk	Gear	Own	Pr.	M & B.		12
75	Singer		10	67.4	4	2½x3⅞	Int.	2	L.		St. Pin	Ther.	Cel.	4	C.I.	SS.	Tr. & Pres.	Gear	Claudl	Gr.	Mag.	Pos.	
76	Singer		15	122.0	6	2⅝x3⅝	Det.	6	L.		Ch.	Ther.	Cel.	4	C.I.	SS.	Tr. & Pres.	Plun.		Vac.	Mag.	Pos.	
77	Sizaire Berwick		25	275.2	4	3¾x6⅝	Int.	4	L.		Sk. Pin	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear	Smith	Vac.	Mag.	Pos.	12
78	Standard		8	65.3	4	2⅞x3½	Det.	4	H.	PR.	St. Pin	Ther.	Tub.	4	Al.	SS.	Trough	Disk	Zenith	Gr.	Bat.	Belt	6
79	Standard		11	117.0	4	2⅝x4⅝	Det.	4	H.	PR.	Ch.	Ther.	Tub.	4	Al.	Slip	Hol-Crk	Gear	Zenith	Vac.	Mag.	Pos.	12
80	Star		12	112.9	4	2¾x4¾	Det.	4	L.		St. Pin	Ther.	Cel.	4	C.I.	SS.	Trough	Plun.	Zenith	Gr.	Mag.	Pos.	12
81	Star		16	180.2	4	3⅛x5½	Int.	2	L.		Ch.	Pump	Cel.	4	C.I.	Hr. Gl.	Hol-Crk	Gear	Zenith	Vac.	Mag.	Belt	12
82	Star		20	226.1	4	3⅛x5½	Int.	2	L.		Ch.	Pump	Cel.	4	C.I.	Hr. Gl.	Hol-Crk	Gear	Zenith	Vac.	Mag.	Belt	12
83	Stroker Squire		15	182.8	4	3½x4¾	Int.	4	L.		Sk. Pin	Pump	Cel.	4	Al.	SS.	Trough	Gear		Vac.	Mag.	Belt	12
84	Stroker Squire		25	235.9	6	3⅛x5½	Int.	1	H.	C.	Bev.	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear		Vac.	Mag.	Pos.	12
85	Sunbeam		14	118.0	4	2⅝x4¾	Det.	4	H.	PR.	Ch.	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear	Claudl	Vac.	Bat.	Belt	12
86	Sunbeam		16	180.2	4	3⅛x5½	Det.	4	H.	PR.	Ch.	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear	Claudl	Vac.	Mag.	Belt	12
87	Sunbeam		24	270.4	6	3⅛x5½	Det.	6	H.	PR.	Ch.	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear	Claudl	Vac.	Mag.	Pos.	12
88	Swift		10	68.7	4	2½x3½	Int.	4	L.		Ch.	Ther.	Tub.	4	C.I.	SS.	Hol-Crk	Gear	Zenith	Gr.	Mag.	Belt	12
89	Swift		12	121.8	4	2¾x5⅛	Int.	4	L.		Ch.	Ther.	Tub.	4	C.I.	SS.	Hol-Crk	Gear	Zenith	Gr.	Mag.	Belt	12
90	Talbot		14	118.0	4	2⅝x4¾	Det.	4	H.	PR.	Ch.	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear	Claudl	Vac.	Bat.	Belt	12
91	Talbot		16	157.2	4	3⅛x5½	Int.	2	L.		Ch.	Pump	Cel.	4	C.I.	SS.	Hol-Crk	Gear	Zenith	Vac.	Mag.	Belt	6
92	Talbot		25	276.5	4	4 x5½	Int.	2	L.		Ch.	Pump	Cel.	4	C.I.	SS.	Hol-Crk	Gear	Zenith	Vac.	Mag.	Belt	12
93	Talbot		36	235.9	6	3⅛x5½	Int.	2	L.		Ch.	Pump	Cel.	4	C.I.	SS.	Hol-Crk	Gear	Zenith	Vac.	Mag.	Belt	12
94	Vauxhall		14	138.9	4	2⅝x5½	Det.	4	L.		St. Pin	Pump	Cel.	3	Al.	SS.	Hol-Crk	Plun.	Zenith	Vac.	Mag.	Belt	
95	Vauxhall		25	243.0	4	3¾x5½	Int.	4	L.		Ch.	Pump	Cel.	4	C.I.	SS.	Hol-Crk	Plun.	Zenith	Pr.	Mag.	Belt	12
96	Vauxhall		30	277.1	4	3⅞x5⅞	Int.	4	L.		Ch.	Pump	Cel.	4	Al.		Hol-Crk	Plun.	Zenith	Pr.	Mag.	Belt	12
97	Vulcan		9	125.3	2	3⅜x3½	Det.	1	S.		Sk. & wm.	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear	Zenith	Gr.	Mag.	Pos.	6
98	Vulcan		16	157.2	4	3½x5½	Det.	4	L.		Sk. Pin	Pump	Cel.	4	C.I.	SS.	Trough	Gear	Zenith	Gr.	Mag.	Belt	12
99	Vulcan		20	197.2	4	3½x5½	Det.	4	L.		Sp. Pin	Pump	Cel.	4	C.I.	SS.	Trough	Gear	Zenith	Gr.	Mag.	Belt	12
100	Vulcan		20	211.7	4	3½x5½	Det.	4	S.		Sk & wm	Pump	Cel.	4	Al.	SS.	Hol-Crk	Gear	Zenith	Vac.	Mag.	Pos.	12
101	Warren Lambert		10	93.3	4	2¾x3⅝	Det.	4	L.		Ch.	Ther.	Cel.	3	C.I	SS.	Tr. & Pres.	Gear		Gr.	Mag.	Belt	
102	Waverley		15	141.4	4	3 x5	Det.	4	L.		Sk. Pin	Ther.	Cel.	4	C.I.	SS.	Hol-Crk	Plun.	Zenith	Gr.	Mag.	Belt	12
103	Westwood		12	112.9	4	2¾x4¾	Det.	4	H.	PR.	Ch.	Pump	Tub.	3	C.I.	SS.	Tr. & Pres.	Gear	Zenith	Vac.	Mag.	Belt	12
104	Wolseley		7	60.1	2	3¼x3⅝	Int.	1	L.		St. Pin	Ther.	Cel.	3	Al.	SS.	Trough	Gear	Own	Gr.	Bat.	Belt	6
105	Wolseley		10	77.4	4	2⅝x3¾	Det.	4	H.	C.	Bev&Ch.	Ther.	Cel.	4	C.I.	SS.	Trough	Gear	Own	Gr.	Bat.	Pos.	6
106	Wolseley		15	157.2	4	3½x5½	Det.	4	H.	C.	Bev&Ch.	Pump	Cel.	4	Al.	SS.	Trough	Gear	Own	Vac.	Bat.	Pos.	12
107	Wolseley		20	235.9	6	3⅛x5½	Int.	2	L.		Ch.	Pump	Cel.	4	Al.	SS.	Trough	Gear	Own	Vac.	Mag.	Pos.	12

ABBREVIATIONS:

Cylinder Head: **Det**—Detachable; **Int**—Integral.
Cylinder Type: **H**—Valves in Head; **S**—Sleeve; **T**—At Opposite Sides; **L**—Valves at Side; **LH**—Valves at Side, Exhaust Over Inlet.
Overhead Valve Operation: **P R**—Push Rods; **C**—Overhead Camshaft.
Camshaft Drive: **St Pin**—Straight Toothed Pinions; **Sk Pin**—Skew Toothed Pinions; **Ch-silent**—(inverted tooth) Chain; **Sp Bev**—Spiral Bevel; **Eccen**—Triple Eccentric Rods; **Sk & Wm**—Skew and Worm Gears; **Bev & Ch**—Bevel Gears and Silent Chain.
Cooling: **A-C**—Air-Cooled; **Ther**—Thermo Syphon.
Radiator Type: **Cel**—Cellular; **Tub**—Tubular.
Piston, Material: **C I**—Cast Iron; **Al**—Aluminum Alloy; **St**—Steel.
Piston, Type: **S S**—Straight Sided; **Hr Gl**—Hour Glass; **Slip**—Slipper (Segmental Skirt); **Spec**—Special.
Lubrication System: **Trough**—Troughs Under Connecting Rods and Catch Pits Over Main Bearings; **Tr & Pres**—Trough and Pressure, i.e. Troughs Under Connecting Rods and Direct Leads to Main Bearings; **Hol-Crk**—Drilled Crankshaft with Pressure Feed to Big-End and Main Bearings.
Type of Oil Pump: **Plun**—Plunger, Operated from Camshaft; **Gear**—Twin Gear Wheels; **Ecce**—Rotating Eccentric with Vane; **Flywh**—Flywheel Lifts Oil to Galleries and Troughs; **Disk**—Disk on Crankshaft Lifts Oil to Galleries and Troughs.
Carbureter Make: **Claudl**—Claudel, W & P, S.U.
Fuel Feed: **Gr**—Gravity; **Vac**—Vacuum; **Pr**—Pressure.
Ignition: **Mag**—Magneto; **M & B**—Magneto and Battery; **Bat**—Battery.
Generator Drive: **Pos**—Positive.
Bearings: **B & P**—Ball and Plain; **Pl**—Plain; **B & R**—Ball and Roller; **Bl**—Ball; **Rol**—Roller.

Percentages of Design Features in British Passenger Cars, 1922

Cylinder Head

Detachable .....54 per cent
Integral .....46 per cent

Cylinders Cast

Block .....72 per cent
Pairs .....13 per cent
Singly ..... 9 per cent
Threes ..... 4 per cent
Fours ..... 2 per cent

Cylinders Separate or Unit with Top Half of Crankcase

Separate .....82 per cent
Unit .....18 per cent

Valve Arrangement

L head .....69 per cent
I head (overhead valves).....24 per cent
Sleeve ..... 6 per cent
F head (inlet over exhaust). 1 per cent

Overhead Valve Operation

Push rods .....54 per cent
Overhead camshaft .....46 per cent

Overhead Camshaft Drive

Worm .....25 per cent
Skew pinions .....17 per cent
Straight bevels .....17 per cent
Bevels and chain.....17 per cent
Chain ..... 8 per cent
Spiral bevels ..... 8 per cent
Eccentric rods ..... 8 per cent

Interior Camshaft Drive

Chain .....59 per cent
Skew pinions .....22 per cent
Straight pinions .....17 per cent
Skew and worm..... 2 per cent

Water Circulation

Pump .....49 per cent
Thermo .....47 per cent
Air-cooled ..... 4 per cent

Water Pump Drive

Positive .....83 per cent
Belt .....17 per cent

Radiator Type

Cellular .....77 per cent
Tubular .....23 per cent

Specifications (Continued)

TRANSMISSION AND OTHER CHASSIS PARTS

BEARINGS				Clutch	Gear Set				REAR AXLE					BRAKES						TIRES		CHASSIS DIMENSIONS				MAKE AND MODEL	No. Car
Gear Set														Hand		Foot										
Mainshaft	Lay Shaft	Front Wheels	Rear Axle	Type	Location	No. Forward Speeds	Steering Gear, Type	Universal Joints, Type	Final Drive	Propulsion Taken By	Torque Ta'en By	Direct Gear Ratio	Type	Type	Location	Type	Location	Rear Springs, Type	Wheels, Type	Type	Size, Ins. or M.M.	Wheel Base, Ins.	Track, Ins.	Ground Clearance, Ins.	Weight of Chassis, Lbs.		
Bl....	Bl....	Bl....	Bl....	D-P....	UE...	4	W.&Wh.	Fab...	SB...	Sp...	Sp...	4.66	Full..	Int..	RW...	Int..	RW...	½E...	Disk...	Cl..	760x 90	111	48	10	1350	Palladium	64
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	3	W.&Wh.	Star...	WO...	TT...	TT...	4.14	Full..	Ext..	RW...	Ext..	DS..	½E...	Wood...	Cl..	760x 90	96	50	9	1220	Phoenix	65
Bl....	Bl....	Bl....	Bl....	Con....	UE...	3	W.&Wh.	Star...	SB...	Sp...	TT...	4.2	Full..	Int..	RW...	Int..	RW...	Cant..	Wood...	Cl..	815x105	126	56	10	1850	Phoenix	66
Bl....	Bl....	Bl....	Bl....	D-P....	UE...	3	Epicy...	Fab...	SB...	Sp...	TT...	4.2	N...	Ext..	DS..	Int..	RW...	½E...	Pr. St....	Cl..	700x 80	102	46	8	....	Rhode	67
Bl....	Bl....	Rol...	B.&R.	Con....	Amid..	4	W.&Wh.	Fab...	SB...	Sp...	Sp...	4	½...	Int..	RW...	Int..	RW...	½E...	Disk....	Cl..	710x 90	108	48	9	1120	Riley	68
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W.&Nut	S. & P.	SB...	TT...	TT...	3.46	Full..	Int..	RW...	Int..	RW...	Cant..	Wire....	Cl..	895x135	144	56	10	3360	Rolls Royce	69
Bl....	Bl....	Rol...	Bl....	D-P....	UE...	3	R.&Pin.	F.&M.	WU...	Sp...	TA...	4.8	½...	Int..	RW...	Int..	RW...	¼E...	Disk....	Cl..	28x 3	88	46	8	670	Rover	70
Bl....	Bl....	Rol...	Bl....	OP....	Amid..	3	W.&Seg.	S. & P.	WU...	Sp...	TA...	4.37	½...	Int..	RW...	Ext..	DS..	½E...	Pr. St....	Cl..	815x105	116	50	7	1680	Rover	71
Bl....	Bl....	Bl....	Bl....	Con....	UA...	3	Marles..	Fab...	SB...	TT...	TT...	4.23	½...	Int..	RW...	Int..	RW...	¾E...	Disk....	Cl..	815x105	117	56	9	2240	Ruston Hornsby	72
Bl....	Bl....	Bl....	Bl....	Con....	UA...	3	Marles..	Fab...	SB...	TT...	TT...	4.23	....	Int..	RW...	Int..	RW...	¾E...	Disk....	Cl..	820x120	126	56	10	....	Ruston Hornsby	73
.....	.....	.....	.....	DM....	UT...	4	.....	Star...	SB...	TT...	TT...	.....	.....	Int..	RW...	Int..	RW...	Cant..	Wire....	Cl..	895x150	150	56	10	2800	Sheffield Simplex	74
Bl....	Bl....	B.&R.	Bl....	Con....	UT...	3	W.&Seg.	Star...	SB...	TT...	TT...	4.5	½...	Int..	RW...	Int..	RW...	¼E...	Disk....	Cl..	26x 3	96	48	8	....	Singer	75
Bl....	Bl....	B.&R.	Bl....	Con....	UT...	3	W.&Seg.	Star...	SB...	TT...	TT...	4	½...	Int..	RW...	Int..	RW...	Cant..	Disk....	Cl..	815x105	117	52	9	....	Singer	76
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W.&Nut	S. & P.	SB...	Sp...	Sp...	4	½...	Int..	DS..	Int..	RW...	½E...	Wire....	Cl..	895x135	141	53	8½	....	Sizaire Berwick	77
Bl....	Pl....	.....	Bl....	D-P....	UT...	3	W.&Wh.	Fab...	WU...	TT...	TT...	5.1	½...	Int..	RW...	Int..	RW...	¼E...	Pr. St....	Cl..	26x 3	102	.....	.....	.....	Standard	78
Bl....	Bl....	.....	Bl....	D-P....	Amid..	4	W.&Wh.	Fab...	WO...	Sp...	Sp...	4.2	½...	Int..	RW...	Ext..	DS..	½E...	Pr. St....	Cl..	30x3½	....	54	.....	.....	Standard	79
Bl....	Bl....	B.&R.	Bl....	D-P....	UE...	3	W.&Wh.	Fab...	SB...	Sp...	Sp...	4.3	N...	Int..	RW...	Ext..	RW...	½E...	Disk....	Cl..	30x3½	108	48	10	1570	Star	80
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W.&Wh.	S.&P.	SB...	Sp...	Sp...	3.9	Full..	Int..	RW...	Ext..	DS..	¾E...	Pr. St....	Cl..	820x120	129	56	9	2300	Star	81
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W.&Wh.	S.&P.	SB...	Sp...	Sp...	3.9	Full..	Int..	RW...	Ext..	DS..	¾E...	Pr. St....	Cl..	820x120	129	56	9	2410	Star	82
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W.&Wh.	S.&P.	SB...	Sp...	Sp...	4.15	½...	Int..	RW...	Int..	RW...	½E...	Pr. St....	Cl..	815x105	117	52	8	2110	Stroker Squire	83
Bl....	Bl....	Bl....	Bl....	D-P....	Amid..	4	W.&Wh.	Star...	SB...	TT...	TT...	4.15	½...	Int..	RW...	Int..	RW...	Cant..	Wire....	Cl..	880x120	127	56	9	1900	Stroker Sqnire	84
Bl....	Bl....	Bl....	Bl....	D-P....	UE...	3	W.&Seg.	Star...	SB...	TT...	TT...	4.15	Full..	Int..	RW...	Int..	RW...	Cant..	Pr. St....	Cl..	815x105	118	51	.....	.....	Sunbeam	85
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W.&Seg.	S.&P.	SB...	Sp...	Sp...	4	Full..	Int..	RW...	Int..	DS..	½E...	Pr. St....	Cl..	820x120	124	57	.....	.....	Sunbeam	86
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W.&Seg.	S.&P.	SB...	Sp...	Sp...	4	Full..	Int..	RW...	Int..	DS..	½E...	Pr. St....	Cl..	820x120	136	57	.....	.....	Suubeam	87
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	3	W.&Wh.	F.&M.	SB...	Sp...	Sp...	4.5	½...	Int..	RW...	Ext..	DS..	½E...	Pr. St....	Cl..	700x 80	90	45	7½	1230	Swift	88
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W.&Wh.	S.&P.	SB...	Sp...	Sp...	4.26	½...	Int..	RW...	Ext..	DS..	½E...	Pr. St....	Cl..	760x 90	108	48	8½	1570	Swift	89
Bl....	Bl....	Bl....	Bl....	D-P....	UE...	3	W.&Seg.	Star...	SB...	TT...	TT...	4.15	Full..	Int..	RW...	Int..	RW...	Cant..	Pr. St....	Cl..	815x105	118	49	.....	.....	Talbot	90
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W.&Seg.	Star...	SB...	TT...	TT...	4.3	Full..	Int..	RW...	Int..	RW...	Cant..	Wire....	Cl..	815x105	121	53	9	1680	Talbot	91
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W.&Seg.	Star...	SB...	TT...	TT...	3.5	Full..	Int..	RW...	Int..	RW...	Cant..	Pr. St....	Cl..	895x135	133	56	10	2890	Talbot	92
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	4	W.&Seg.	Star...	SB...	TT...	TT...	4	Full..	Int..	RW...	Int..	RW...	½E...	Wire....	Cl..	880x120	139	56	10	3000	Talbot	93
.....	.....	.....	.....	D-P....	UE...	3	Marles..	.....	St. B..	Sp...	TT...	4	.....	Int..	RW...	Int..	RW...	Cant..	Disk....	Cl..	815x105	116	50	.....	.....	Vauxhall	94
Bl....	Bl....	Bl....	Bl....	MDO...	Amid..	4	W.&Wh.	S.&P.	SB...	Sp...	TA...	3.6	Full..	Int..	RW...	Int..	DS..	½E...	Wire....	Cl..	880x120	120	56	9	3000	Vauxhall	95
Bl....	Bl....	Bl....	Bl....	MDO...	Amid..	4	W.&Wh.	S.&P.	St. B..	Sp...	TA...	3	½...	Int..	RW...	Int..	DS..	½E...	Wire....	Cl..	820x120	114	54	8	2680	Vauxhall	96
Bl....	Bl....	.....	Bl....	Con....	UT...	3	W.&Seg.	Star...	St. B..	TT...	TT...	4	.....	Int..	RW...	Int..	RW...	C&½E	Disk....	Cl..	710x 90	108	48	8½	....	Vulcan	97
Bl....	Bl....	.....	Bl....	Con....	Amid..	4	W.&Wh.	S.&P.	WO...	Sp...	Sp...	4	.....	Int..	RW...	Ext..	DS..	½E...	Pr. St....	Cl..	815x105	123	56	7½	....	Vulcan	98
Bl....	Bl....	.....	Bl....	Con....	Amid..	4	W.&Wh.	S.&P.	WO...	Sp...	Sp...	4	.....	Int..	RW...	Ext..	DS..	½E...	Pr. St....	Cl..	820x120	123	56	7	....	Vulcan	99
Bl....	Bl....	.....	Bl....	Con....	Amid..	4	W.&Wh.	Star...	WO...	TT...	TT...	4	.....	Int..	RW...	Int..	RW...	½E...	Pr. St....	Cl..	820x120	128	56	9½	....	Vulcan	100
Bl....	Bl....	Bl....	Bl....	D-P....	UT...	3	Epicy...	Fab...	St. B..	TT...	TT...	4.3	½...	Int..	RW...	Int..	RW...	¼E...	Disk....	Cl..	700x 80	96	44	7½	950	Warren Lambert	101
Bl....	Bl....	Rol...	Bl....	Con....	Amid..	3	Bev....	Fab...	SB...	Sp...	Sp...	4.27	½...	Int..	RW...	Int..	RW...	¼Dul.	Disk....	Cl..	.....	120	50	9	1680	Waverley	102
Bl....	Bl....	Bl....	Bl....	Con....	Amid..	3	W.&Wh.	Fab...	SB...	Sp...	TA...	4.7	Full..	Int..	RW...	Int..	RW...	½E...	Disk....	Cl..	760x 90	110	49	7½	2060	Westwood	103
Bl....	Pl....	Rol...	Rol...	Con....	UE...	3	W.&Wh.	Fab...	SB...	Sp...	Sp...	5.1	N...	Int..	RW...	Int..	RW...	¼E...	Pr. St....	Cl..	26x 3	97	44	7	784	Wolseley	104
Rol...	Pl....	Rol...	Rol...	MDO...	UA...	3	W.&Wh.	Star...	WU...	Sp...	TT...	5.25	½...	Int..	RW...	Int..	RW...	¼E...	Pr. St....	Cl..	710x 90	99	46	7	1000	Wolseley	105
Rol...	Rol...	Rol...	Rol...	MDO...	Amid..	3	W.&Wh.	Fab...	WU...	Sp...	TT...	4.8	½...	Int..	RW...	Int..	RW...	¼E...	Pr. St....	Cl..	815x105	118	52	7½	1680	Wolseley	106
B.&R.	Rol...	Rol...	B.&R.	MDO...	Amid..	4	W.&Seg.	S.&P.	WU...	Sp...	TA...	4.6	Full..	Int..	RW...	Ext..	DS..	Cant..	Wire....	Cl..	820x120	137	54	6½	2440	Wolseley	407

Clutch Type: **D P**—Dry Single Plate; **O P**—Single Plate in Oil; **Con**—Cone; **M D O**—Multiple Disk in Oil; **D M**—Dry Multiple Disk.

Gearset Location: **Amid**—Amidship; **U E**—Unit with Engine; **U A**—Unit with Axle; **U T**—Unit with Torque Tube; **F D**—Friction Drive.

Steering Gear Type: **W & Wh**—Worm and Full Worm Wheel; **W & Seg**—Worm and Worm Wheel Segment; **W & Nut**—Worm and Nut; **Rk & Pin**—Rack and Pinion; **Epicy**—Epicyclic; **Marles**—Marles Cam Gear.

Universal Joints: **Fab**—Fabric Disk; **S & P**—Star and Pot Type; **F & M**—Fabric Disk and Metal; **Pot**—Pot Type (metal); **Star**—Star Type (metal); **Len**—Leather Disk; **S & L**—Star and Leather Disk; **M D**—Metal Disk.

Final Drive: **W O**—Worm Over Axle; **W U**—Worm Under Axle; **S B**—Spiral Bevel; **St B**—Straight Toothed Bevel; **I G**—Internal Gear.

Drive and Torque: **TT**—Torque Tube; **Sp**—Springs; **RR**—Radius Rods; **T A**—Torque Arm.

Rear Axle: **Full**—Full Floating; **½**—Semi-floating; **N**—Non-floating.

Brakes: **Int**—Internal Expanding Shoes; **Dsk**—Disk; **Ext**—External Contracting Shoes or Band; **R W**—On Rear Wheels; **P S**—On Pinion or Worm, Shaft, Front or Back or Axle Casing; **D S**—On Drive Shaft at Rear of Gearset.

Springs: **¼ E**—Quarter Elliptic; **½ E**—Semi-Elliptic; **¾ E**—Three-quarter Elliptic; **Trans**—Transverse Inverted Semi-Elliptic; **Cant**—Cantilever; **¼ Dul**—Two Super-imposed Quarter Elliptic; **C & ½ E**—Cantilever Fore and Aft Anchored to Semi-Elliptic Amidships, at Each Side of Chassis.

Wheels: **Pr St**—Hollow Spoked Pressed Steel with Integral Rim.

Tires: **Cl**—Clincher; **S S**—Straight Sided.

[1]Troughs Connected to Throttle.
[2]Four Valves Per Cyl.
[3]Oil Cooled Cylinders.

Radiator Casing Material

Sheet brass	60 per cent
White metal	32 per cent
Cast aluminum	6 per cent
Sheet steel casing	2 per cent

Engine Mounting

In main frame	82 per cent
In sub frame	18 per cent

Suspension in Main Frame

4 point	65 per cent
3 point	35 per cent

Suspension in Sub Frame

4 point	100 per cent

Sub Frame Support

4 point	68 per cent
6 point	16 per cent
3 point	10 per cent
8 point	6 per cent

Pistons, Material

Cast iron	61 per cent
Aluminum	37 per cent
Steel	2 per cent

Type

Straight side	88 per cent
Hour-glass	6 per cent
Slipper	5 per cent
Ricardo trunk	1 per cent

Scraper Ring

None	56 per cent
In skirt	28 per cent
Above pin	16 per cent

No. of Rings

3	63 per cent
2	29 per cent
4	6 per cent
5	1 per cent
6	1 per cent

Wrist Pin Fixing

Floating	34 per cent
In piston bosses	41 per cent
In connecting rod	25 per cent

Engine Lubrication

Pressure	54 per cent
Trough	23 per cent
Trough and pressure	17 per cent
Full pressure	4 per cent
Splash	2 per cent

(*Continued on page* 388)

Specifications of Continental European Passenger Car Chassis

(Compiled for Automotive Industries by W. F. Bradley.)

Nationality and Make	Wheelbase (In.)	Track (In.)	No. of Cylinders	Valve Location	Camshaft Location	Cylinder Head	BORE AND STROKE			Piston Displacement (Cu. In.)	H.P. (Nominal)	Cooling	Lubricating System	Carbureter Make	Fuel Feed	Ignition	Starting and Lighting	Clutch	Speeds	Gearset Location	Position of Levers	Final Drive	Tires Size (Mm.)	Wheels	Rear Springs	Brake Location
							Mm.	In.	Ratio																	
FRENCH																										
Alba	114	49	4	L...	C'case...	Fix.	65x130	2.56x5.12	2	105	9	Ther...	Press...	Zenith...	Grav.	Mag...	2-Unit...	Cone...	3	Amid...	R...	Bev...	760x90	Wood...	¼-El...	Fr.-R...
Alva	118	51	4	I...	C'case...	Det.	75x130	2.95x5.12	1.7	139	11	Pump...	Press...	Solex...	Vac.	De'co...	Delco...	Cone...	4	Unit E..	C...	Bev...	765x105	Wire...	½-El...	Fr.-R...
Ariès	99	49	4	I...	Head...	Det.	60x85	2.36x3.85	1.4	59	5	Ther...	Circ...	Claudel...	Vac...	Mag...	2-Unit...	Disk...	3	Amid...	C...	Sp. Bev...	650x65	Disk...	¾-El...	R...
Ariès	114	49	4	L...	C'case...	Fix.	72x120	2.83x4.73	1.7	119	10	Ther...	Press...	Zenith...	Vac.	Mag...	2-Unit...	Disk...	4	Unit E..	R...	Sp. Bev...	815x105	Disk...	½-El...	Fr.-R...
Ariès	118	56	4	L...	C'case...	Fix.	80x140	3.15x5.52	1.7	172	15	Ther...	Press...	Zenith...	Vac.	Mag...	2-Unit...	Disk...	4	Amid...	R...	Sp. Bev...	880x120	Disk...	½-El...	R...
Ballot	115	54	4	I...	C'case...	Det.	70x130	2.75x5.12	1.8	120	15	Pump...	Press...	Zenith...	Vac.	Delco...	Delco...	Disk...	4	Unit E..	R...	Bev...	820x120	Wire...	Cant...	Fr.-R...
Ballot	110	51	4	I...	Head...	Fix.	69.9x130	2.75x5.12	1.8	120	16	Pump...	Circ...	Zenith...	Vac...	Mag...	2-Unit...	Disk...	4	Amid...	R...	Bev...	820x120	Wire...	½-El...	Fr.-R...
Beck	105	52	4	I...	Head...	Det.	65x113	2.56x4.12	1.7	92	10	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit...	Disk...	3	Unit E..	C...	Bev...	765x105	Disk...	Coil...	Tr.-R...
Bazelaire	110	55	4	L...	C'case...	Fix.	70x130	2.75x5.12	1.8	120	12	Pump...	Press...	Zenith...	Vac...	Delco...	2-Unit...	Disk...	4	Unit E..	R...	Bev...	765x105	Disk...	½ El...	Tr.-R...
Bazelaire	122	55	4	L...	C'case...	Fix.	80x140	3.15x5.52	1.7	172	12	Pump...	Press...	Zenith...	Vac...	Mag...	2 Unit...	Disk...	4	Unit E..	R...	Bev...	820x120	Wire...	½ El...	Tr.-R...
Bedelia	110	40	2	L...	C'case...	Fix.	80x99	3.15x3.90	1.2	61	6	Air...	Splash...	Zenith...	Grav..	Mag...	None...	Plate...	3	Amid...	R...	Belt...	650x65	Wire...	¼ El...	R...
Bellanger	103	57	4	I...	C'case...	Fix.	90x125	3.54x4.92	1.3	193	17	Pump...	Press...	Zenith...	Press.	Bat...	2-Unit...	Disk...	3	Unit E..	C...	Sp. Bev...	810x90	Wood...	Cant...	F.-Tr.-R...
Bellanger	114	56	4	L...	C'case...	Det.	88x127	3.46x5.00	1.4	188	15	Ther...	Circ...	Jackson...	Grav..	Bat...	2 Unit West...	Disk...	3	Unit E..	R...	Sp. Bev...	820x105	Wood...	½ El...	R...
Bellanger	147	57	8	I...	C'case...	Fix.	90x125	3.54x4.92	1.3	386	50	Pump...	Press...	Zenith...	Press.	Bat...	2-Unit...	Disk...	3	Unit E..	R...	Sp. Bev...	935x135	Steel...	Cant...	F.-Tr.-R...
Benjamin	89	34	4	L...	C'case...	Fix.	54x82	2.12x3.19	1.5	46	5	Ther...	Press...	Zenith...	Grav..	Mag...	None...	Disk...	3	Unit E..	R...	Bev...	650x65	Disk...	¾ El...	R...
Berliet	123	56	4	L...	C'case...	Det.	90x130	3.54x5.12	1.4	200	16	Pump...	Circ...	Own...	Vac...	Mag...	1 Unit...	Disk...	3	Unit E..	R...	Sp. Bev...	820x120	Disk...	Cant...	Tr.-R...
Berliet	135	57	4	L...	C'case...	Det.	100x140	3.94x5.52	1.4	267	25	Pump...	Press...	Own...	Vac...	Mag...	1 Unit...	Disk...	4	Amid...	R...	Sp. Bev...	895x150	Disk...	Cant...	Tr.-R...
Bignan	102	41	4	I...	C'case...	Det.	62x90	2.44x3.54	1.4	66	8	Ther...	Circ...	Zenith...	Grav..	Mag...	None...	Disk...	3	Unit E..	R...	Sp Bev...	650x65	Wire...	¾ El...	R...
Bignan	112	52	4	L...	C'case...	Fix.	92x130	3.62x5.12	1.4	210	18	Pump...	Press...	Zenith...	Vac...	Mag...	2 Unit...	Plate...	4	Unit E..	R...	Sp. Bev...	820x120	Wire...	½ El...	F. Tr. R...
Bollée, Léon	126	55	4	L...	C'case...	Fix.	85x130	3.35x5.12	1.5	179	15	Ther...	Press...	Zenith...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Sp. Bev...	820x120	Disk...	½-El...	Tr.-R...
Bollée, Léon	130	55	6	I...	Head...	Det.	83x110	3.27x4.33	1.3	159	18	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Bev...	820x120	Wood...	½-El...	Tr.-R...
Brasier	129	55	4	L...	C'case...	Fix.	85x150	3.35x5.91	1.7	207	18	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit S.E.V...	Cone...	4	Amid...	R...	Sp. Bev...	880x120	Wire...	½-El...	Tr.-R...
Bugatti	95	44	4	I...	Head...	Fix.	65x100	2.56x3.94	1.5	81	6	Pump...	Press...	Zenith...	Press.	Mag...	None...	Disk...	4	Amid...	R...	Bev...	710x90	Wire...	¼-El...	Tr.-R...
Bugatti	118	52	8	I...	Head...	Fix.	69x100	2.72x3.94	1.4	183	14	Pump...	Press...	Own...	Grav..	Mag...	1-Unit...	Disk...	2	Unit A	R...	Bev...	820x120	Wire...	¼-El...	Fr.-R...
Buchet	105	48	4	L...	C'case...	Fix.	65x110	2.56x4.33	1.7	89	8	Ther...	Press...	Solex...	Grav.	Mag...	2-Unit...	Cone...	4	Unit E..	C...	Bev...	760x90	Disk...	½-El...	Tr.-R...
Charron	90	41	4	L...	C'case...	Fix.	58x100	2.28x3.94	1.7	64	6	Ther...	Circ...	Zenith...	Grav.	Mag...	1-Unit...	Cone...	3	Unit E..	C...	Bev...	710x90	Disk...	½-El...	Tr.-R...
Charron	134	56	4	L...	C'case...	Fix.	85x150	3.35x5.91	1.7	208	15	Pump...	Circ...	Zenith...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Sp. Bev...	880x120	Wire...	½-El...	Tr.-R...
Chenard & Walcker	110	47	4	L...	C'case...	Fix.	69x100	2.72x3.94	1.4	91	8	Ther...	Press...	Solex...	Grav.	Mag...	2-Unit...	Cone...	3	Amid...	R...	Int. Gear	710x90	Disk...	½-El	Tr.-R...
Chenard & Walcker	112	52	4	L...	C'case...	Fix.	70x130	2.75x5.12	1.8	120	10	Ther...	Press...	Solex...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Int. Gear	760x90	Disk...	½-El...	Tr.-R...
Chenard & Walcker	130	55	4	L...	C'case...	Fix.	80x150	3.15x5.91	1.8	184	15	Ther...	Press...	Solex...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Int. Gear	880x120	Wire...	½-El...	Tr.-R...
Chenard & Walcker	120	55	4	I...	C'case...	Fix.	80x150	3.15x5.91	1.8	184	15	Ther...	Press...	Solex...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Int. Gear	880x120	Wire...	½-El...	F.-Tr.-R...
Citroen	90	47	4	L...	C'case...	Det.	55x90	2.16x3.54	1.6	52	5	Ther...	Pump...	Solex...	Grav.	Delco...	Delco...	Plate...	3	Unit E..	C...	Chev...	650x65	Disk...	¼-El...	R...
Citroen	114	48	4	L...	C'case...	Det.	65x100	2.56x3.94	1.5	81	10	Ther...	Press...	Solex...	Grav.	Mag...	2-Unit...	Plate...	3	Unit E..	C...	Chev...	710x90	Disk...	¼-El...	Tr.-R...
Colda	107	50	4	L...	C'case...	Fix.	70x120	2.75x4.73	1.7	111	10	Ther...	Circ...	Zenith...	Vac...	Mag...	2-Unit...	Plate...	3	Unit E..	C...	Bev...	760x90	Wire...	½-El...	Fr.-R...
Corre-la-Licorne	102	49	4	L...	C'case...	Fix.	65x100	2.56x3.94	1.5	81	10	Ther...	Press...	Zenith...	Grav.	Mag...	Lights only...	Cone...	4	Amid...	R...	Bev...	710x90	Disk...	½-El...	Tr.-R...
Corre-la-Licorne	110	49	4	L...	C'case...	Fix.	65x120	2.56x4.72	1.8	97	11	Ther...	Press...	Zenith...	Grav.	Mag...	Lights only...	Cone...	4	Amid...	R...	Bev...	760x90	Disk...	½-El...	Tr.-R...
Cottin-Desgouttes	133	55	4	L...	C'case...	Fix.	80x160	3.15x6.30	2	196	14	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit S.E.V...	Cone...	4	Unit E..	R...	Sp. Bev...	880x120	Disk...	Cant...	Tr.-R...
Cottin-Desgouttes	133	55	4	L...	C'case...	Fix.	90x160	3.54x6.30	1.7	247	18	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit S.E.V...	Cone...	4	Unit E..	R...	Sp. Bev	880x120	Disk...	Cant...	Tr.-R...
Cottin-Desgouttes	133	55	4	L...	C'case...	Fix.	100x160	3.94x6.30	1.6	305	23	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit S.E.V...	Cone...	4	Unit E	R...	Sp. Bev...	880x120	Wire...	Cant...	Tr.-R...
Crespelle	135	55	4	L...	C'case...	Fix.	80x120	3.15x4.73	1.5	147	14	Pump...	Circ...	Zenith...	Vac...	Mag...	2-Unit...	Disk	4	Amid	R...	Bev...	820x120	Disk...	½-El...	Tr.-R...
De Dion-Bouton	114	48	4	L...	C'case...	Fix.	70x120	2.75x4.72	1.7	111	12	Pump...	Press...	Zenith...	Grav.	Mag...	2-Unit own...	Plate...	4	Unit E	R...	Sp. Bev...	760x90	Disk...	Cant...	Tr.-R...
De Dion-Bouton	133	52	4	L...	C'case...	Fix.	85x130	3.35x5.12	1.5	180	15	Pump...	Press...	Solex...	Vac...	Mag...	1-Unit...	Plate...	4	Unit E	R...	Sp. Bev...	880x120	Disk...	Cant...	R...
De Dion-Bouton	125	49	8	L...	C'case...	Fix.	65x100	2.56x3.94	1.5	162	18	Pump...	Press...	Solex...	Vac...	Mag...	1-Unit...	Plate...	4	Unit E	R...	Sp. Bev...	815x105	Disk...	Cant...	R...
De Dion-Bouton	133	52	8	L...	C'case...	Int.	70x120	2.75x4.72	1.7	222	20	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit own...	Plate...	4	Unit E	R...	Sp. Bev...	880x120	Disk...	Cant...	Tr-R...
Delage	116	52	4	L...	C'case...	Det.	72x130	2.83x5.12	1.8	129	11	Ther...	Circ...	Zenith...	Vac...	Mag...	1-Unit...	Disk...	4	Unit E	C...	Sp. Bev...	765x105	Wire...	½-El...	Fr.-R...
Delage	135	56	4	L...	C'case...	Fix.	80x150	3.15x5.91	1.8	184	16	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit S.E.V...	Disk	4	Unit E	R...	Sp. Bev...	880x120	Wire...	¾-El...	F.-Tr.-R...
Delage	135	56	6	I...	C'case...	Fix.	80x150	3.15x5.91	1.8	276	25	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit S.E.V...	Disk	4	Unit E	R...	Sp. Bev...	895x135	Wire...	¾-El...	F.-Tr.-R...
Delage	135	56	6	L...	C'case...	Fix.	80x150	3.15x5.91	1.8	276	25	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit S.E.V...	Disk	4	Unit E	R...	Sp. Bev...	895x135	Wire...	¾-El...	F.-Tr.-R...
Delahaye	118	51	4	L...	C'case...	Fix.	70x120	2.75x4.72	1.7	111	10	Pump...	Circ...	Solex...	Vac...	Mag...	1-Unit...	Cone...	4	Unit E	C...	Sp. Bev...	765x105	Disk...	½-El...	Tr.-R...
Delahaye	129	54	4	L...	C'case...	Fix.	85x130	3.35x5.12	1.5	179	18	Pump...	Circ...	Claudel...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Sp. Bev...	820x120	Wire...	½-El...	Tr.-R...
Delahaye	136	54	6	L...	C'case...	Fix.	85x130	3.35x5.12	1.5	269	18	Pump...	Circ...	Cozette...	Vac...	Mag...	2-Unit...	Cone...	4	Unit E	R...	Sp. Bev...	895x135	Wire...	½-El...	Fr -R...
Delaugère-Clayette	116	56	4	I...	C'case...	Det.	70x140	2.75x5.51	2	131	10	Pump...	Circ...	Zenith...	Vac...	Mag...	1-Unit S.E.V...	Cone...	4	Unit E	R...	Bev...	815x105	Disk...	½-El...	Tr.-R...
Delaugère-Clayette	125	56	4	L...	C'case...	Fix.	85x140	3.35x5.51	1.6	194	15	Pump...	Circ...	Zenith...	Vac...	Mag...	1-Unit...	Cone...	4	Unit E	R...	Sp. Bev...	880x120	Disk...	½-El...	R...
Delaunay-Belleville	120	56	4	L...	C'case...	Det.	72x120	2.83x4.72	1.7	119	10	Pump...	Press...	Solex...	Vac...	Mag...	1-Unit...	Disk...	4	Unit E	R...	Sp. Bev...	765x105	Disk...	½-El...	Tr.-R...
Delaunay-Belleville	133	56	6	L...	C'case...	Fix.	78x140	3.07x5.51	1.8	245	20	Pump...	Press...	Own...	Vac...	Mag...	2-Unit...	Disk...	4	Amid...	R...	Sp. Bev...	895x135	Wire...	Plat...	Tr.-R...
Delaunay-Belleville	142	59	6	L...	C'case...	Fix.	88x150	3.46x5.91	1.7	333	30	Pump...	Press...	Own...	Vac...	Mag...	2-Unit...	Disk...	4	Amid...	R...	Sp. Bev...	895x135	Wire...	Plat...	Tr.-R...
Delaunay-Belleville	145	56	6	I...	C'case...	Det.	103x160	4.06x6.30	1.5	488	45	Pump...	Press...	Own...	Vac...	Mag...	2-Unit...	Disk	4	Amid...	R...	Sp. Bev...	935x135	Wire...	Plat...	Tr.-R...
Doriot-Flandrin & Parant	110	47	4	L...	C'case...	Det.	65x120	2.16x4.72	1.8	97	10	Ther...	Press...	Zenith...	Vac...	Delco...	1-Unit...	Cone...	3	Unit E..	R...	Sp. Bev...	760x90	Disk...	½-El...	R...
Doriot-Flandrin & Parant	119	50	4	L...	C'case...	Fix.	70x130	2.75x5.12	1.8	122	12	Pump...	Circ...	Zenith...	Vac...	Mag...	2-Unit...	Cone...	4	Amid...	R...	Sp. Bev...	765x105	Disk...	Cant...	Fr.-R...
Farman	142	56	6	I...	Head...	Fix.	100x140	3.94x5.51	1.4	401	40	Pump...	Press...	Zenith...	Vac...	Mag...	2-Unit...	Disk...	4	Unit E..	C...	Sp. Bev...	895x135	Wire...	Cant...	Tr.-R...
Fonck	122	55	4	I...	Head...	Det.	80x130	3.15x5.12	1.6	160	15	Pump...	Press...	Cozette...	Vac...	Mag...	2-Unit...	Disk...	3	Unit E..	R...	Sp. Bev...	820x120	Wire...	½-El...	F.-Tr.-R...
Fonck	143	55	8	I...	Head...	Det.	80x130	3.15x5.12	1.6	319	30	Pump...	Press...	Cozette...	Vac...	2 Mags...	2-Unit...	Disk...	3	Unit E..	R...	Sp. Bev...	895x135	Wire...	½-El...	F-Tr.-R...
Gobron	145	56	6	Sl...	C'case...	Fix.	85x220	3.35x8.66	2.6	458	40	Pump...	Press...	Zenith...	Vac...	Delco...	Delco...	Disk...	3	Unit E..	R...	Bev...	895x135	Wire...	Cant...	Fr.-R...

Nationality and Make	Wheelbase (In.)	Track (In.)	No. of Cylinders	Valve Location	Camshaft Location	Cylinder Head	BORE AND STROKE Mm.	BORE AND STROKE In.	BORE AND STROKE Ratio	Piston Displacement (Cu. In.)	H.P. (Nominal)	Water Circulation	Lubricating System	Carbureter Make	Fuel Feed	Ignition	Starting and Lighting	Clutch	Speeds	Gearset Location	Position of Levers	Final Drive	Tires (Mm.)	Wheels	Rear Springs	Brake Location
FRENCH (Contin.)																										
Gregoire	118	51	4	L...	C'case...	Fix.	70x130	2.75x5.12	1.8	120	11	Pump...	Press....	Zenith....	Vac...	Delco.....	Delco.....	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Wire....	½-El...	Tr.-R.....
Gregoire	118	51	4	I...	C'case...	Det.	75x130	2.95x5.12	1.7	139	16	Pump...	Press....	Zenith....	Vac...	Db. Delco.	Db. Delco.....	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Wire....	½-El...	Tr.-R.....
Hispano-Suiza	145	56	6	I...	Head...	Fix.	100x140	3.94x5.52	1.4	401	40	Pump...	Press....	Own.....	Press..	Delco.....	2-Unit Delco...	Disk....	3	Unit E..	R.....	Sp. Bev...	895x135	Wire....	½-El...	Tr.-R.....
Hotchkiss	132	55	4	I...	Head...	Det.	95x140	3.74x5.52	1.4	242	18	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R.....	Sp. Bev...	895x135	Wire....	Cant....	Tr.-R.....
Hotchkiss	147	57	6	I...	Head...	Det.	100x140	3.94x5.51	1.4	401	30	Pump...	Press....	Zenith....	Vac...	M. Delco..	2-Unit.....	Disk....	4	Unit E..	C.....	Sp. Bev...	895x135	Wire....	Cant....	F.-Tr.-R...
Hurtu	118	51	4	L...	C'case...	Fix.	76x130	2.99x5.12	1.7	144	14	Ther....	Press....	Solex.....	Grav..	Mag.....	1-Unit.....	Cone....	4	Unit E..	R.....	Bev.....	810x90	Wood...	Cant....	Tr.-R.....
Irat	110	51	4	I...	C'case...	Det.	70x130	2.75x5.12	1.7	122	10	Ther....	Press....	Zenith....	Vac...	Mag.....	1-Unit.....	Disk....	4	Unit E..	C.....	Sp. Bev...	760x90	Disk....	½-El...	Fr.-R.....
La Buire	117	52	4	L...	C'case...	Fix.	75x150	2.95x5.90	2	161	12	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Unit E..	R.....	Bev.....	820x120	Disk....	Cant....	Fr.-R.....
Lorraine-Dietrich	114	56	6	I...	C'case...	Fix.	75x130	2.95x5.12	1.7	209	16	Pump...	Press....	Zenith....	Vac...	Delco.....	Delco.....	Plate...	3	Unit E.	C.....	Sp. Bev...	815x105	Steel....	Cant....	R.....
Lorraine-Dietrich	131	56	6	L...	C'case...	Fix.	90x160	3.54x6.30	1.7	370	30	Pump...	Press....	Zenith....	Vac...	Delco.....	Delco.....	Disk....	4	Amid...	R.....	Sp. Bev...	895x135	Wire....	¾-El...	Tr.-R.....
Majola	91	40	4	I...	C'case...	Fix.	59x90	2.32x3.54	1.5	59	12	Ther....	Press....	Claudel...	Grav..	Mag.....	Lights only....	Cone....	3	Amid...	R.....	Bev.....	710x90	Disk....	½-El...	Tr.-R.....
Majola	110	40	4	I...	C'case...	Fix.	65x105	2.56x4.13	1.6	84	20	Ther....	Press....	Claudel...	Grav..	Mag.....	Lights only....	Cone....	3	Amid...	R.....	Bev.....	760x90	Disk....	¼-El...	R.....
Mathis	92	43	4	L...	C'case...	Fix.	55x80	2.16x3.15	1.4	46	5	Ther....	Circ....	Solex.....	Grav..	Mag.....	1-Unit.....	Disk....	4	Unit E..	C.....	Sp. Bev...	760x80	Disk....	½-El...	R.....
Mathis	94	43	4	L...	C'case...	Fix.	60x100	2.36x3.94	1.7	68	10	Ther....	Press....	Solex.....	Grav..	Mag.....	2-Unit.....	Disk....	3	Unit E..	C.....	Bev.....	710x90	Disk....	½-El...	R.....
Mors	125	54	4	Sl...	C'case...	Det.	80x140	3.15x5.51	1.7	172	15	Pump...	Circ....	Zenith....	Vac...	Mag.....	2-Unit.....	Band...	4	Amid...	R.....	Chev.....	820x120	Disk....	½-El...	Fr.-Tr.-R
Moteblec	128	52	4	L...	C'case...	Fix.	80x120	3.15x4.72	1.5	147	12	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R.....	Bev.....	820x120	Disk....	¾-El...	Tr.-R.....
Moteblec	128	52	4	L...	C'case...	Fix.	80x148	3.15x5.83	1.8	181	15	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R.....	Bev.....	835x135	Disk....	¾-El...	Tr.-R.....
Mourre	86	40	2	L...	C'case...	Fix.	75x120	2.95x4.72	1.6	65	8	Ther....	Splash..	Zenith....	Grav.	Mag.....	None.....	Frict..	Frict.	Chain...	R.....	Chain.....	650x65	Wire....	¼-El...	R.....
Panhard & Levassor	107	51	4	L...	C'case...	Kngt	60x105	2.36x4.13	1.7	73	10	Pump...	Circ....	Own.....	Vac...	Mag.....	1-Unit.....	Plate...	4	Unit E.	C.....	Sp. Bev...	760x90	Wood...	¼-El...	R.....
Panhard & Levassor	114	56	4	L...	C'case...	Fix.	72x140	2.83x5.51	1.9	139	12	Pump...	Circ....	Own.....	Vac...	Mag.....	2-Unit.....	Plate...	4	Unit E.	R.....	Sp. Bev...	820x120	Wire....	½-El...	R.....
Panhard & Levassor	129	56	4	Sl...	C'case...	Det.	85x140	3.35x5.51	1.6	193	16	Pump...	Circ....	Own.....	Vac...	Mag.....	2-Unit.....	Plate...	4	Unit E.	R.....	Sp. Bev...	880x120	Wood...	½-El...	R.....
Panhard & Levassor	136	55	4	Sl...	C'case...	Det.	105x140	4.13x5.51	1.3	296	20	Pump...	Circ....	Own.....	Vac...	Mag.....	2-Unit.....	Plate...	4	Unit E.	R.....	Sp. Bev...	895x135	Wood...	½-El...	R.....
Panhard & Levassor	148	58	8	Sl...	C'case...	Kn.	85x140	3.35x5.51	1.6	388	40	Pump...	Circ....	Own.....	Vac...	Mag.....	2-Unit.....	Plate...	4	Unit E.	R.....	Sp. Bev...	895x135	Wood...	½-El...	Fr.-R.....
Paquis	100	47	4	L...	C'case...	Fix.	65x120	2.56x4.72	1.8	97	10	Ther....	Circ....	Zenith....	Grav..	Mag.....	Light.....	Cone....	4	Amid...	R.....	Bev.....	760x90	Disk....	½-El...	R.....
Paulet	126	56	6	I...	C'case...	Det.	75x130	2.95x5.12	1.7	210	30	Pump...	Press....	Zenith....	Delco.	Delco.....	2-Unit.....	Disk....	3	Unit E..	C.....	Sp. Bev...	895x135	Wire....	½-El...	Fr.-Tr.-R
Peugeot	90	36	4	L...	C'case...	Fix.	50x85	1.98x3.35	1.7	39	8	Ther....	Press....	Zenith....	Grav..	Mag.....	None.....	Cone....	3	Unit A..	R.....	Worm.....	650x65	Wire....	¼-El...	R.....
Peugeot	98	47	4	L...	C'case...	Fix.	66x105	2.60x4.13	1.6	88	10	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	C.....	Worm.....	710x90	Wood...	Cant....	R.....
Peugeot	122	54	4	L...	C'case...	Fix.	82x130	3.23x5.12	1.5	167	14	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Amid...	R.....	Sp. Bev...	820x120	Wire....	Cant....	R.....
Peugeot	144	57	6	Sl...	C'case...	Fix.	95x140	3.74x5.51	1.4	424	25	Pump...	Press....	2-Zenith.	Vac...	Mag.....	2-Unit.....	Disk....	4	Amid...	R.....	Sp. Bev...	880x120	Wire....	Cant....	R.....
Philos	117	49	4	L...	C'case...	Fix.	65x120	2.56x4.72	1.8	97	10	Ther....	Press....	Zenith....	Grav..	Mag.....	2-Unit.....	Disk....	3	Unit E.	R.....	Bev.....	760x90	Disk....	½-El...	Tr.-R.....
Renault	103	56	4	L...	C'case...	Fix.	75x120	2.95x4.72	1.6	129	10	Ther....	Circ....	Own.....	Grav..	Mag.....	1-Unit.....	Cone....	3	Amid...	R.....	Sp. Bev...	760x90	Disk....	Transv..	Tr.-R.....
Renault	120	56	4	L...	C'case...	Fix.	80x140	3.15x5.51	1.7	172	12	Ther....	Circ....	Own.....	Grav..	Mag.....	2-Unit S.E.V...	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Wood...	½-El...	Tr.-R.....
Renault	130	56	4	L...	C'case...	Fix.	95x160	3.74x6.30	1.7	330	18	Ther....	Circ....	Own.....	Press.	Mag.....	2-Unit S.E.V...	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Wood...	½-El...	Tr.-R.....
Renault	145	56	6	L...	C'case...	Fix.	80x140	3.15x5.51	1.7	257	40	Ther....	Circ....	Own.....	Grav..	Mag.....	1-Unit.....	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Wood...	½-El...	Tr.-R.....
Rochet-Schneider	129	53	4	L...	C'case...	Fix.	80x130	3.15x5.12	1.6	160	12	Ther....	Press....	Zenith....	Press.	Mag.....	2-Unit.....	Cone....	4	Unit E.	R.....	Sp. Bev...	815x105	Disk....	Cant....	Tr.-R.....
Rochet-Schneider	133	56	4	L...	C'case...	Fix.	95x140	3.74x5.51	1.4	242	18	Ther....	Press....	Zenith....	Press.	Mag.....	2-Unit.....	Cone....	4	Amid...	R.....	Sp. Bev...	880x120	Disk....	Cant....	Fr.-Tr.-R
Rochet-Schneider	141	57	6•	L...	C'case...	Fix.	100x130	3.94x5.12	1.3	374	30	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R.....	Sp. Bev...	880x120	Disk....	Cant....	Fr.-Tr.-R
Rolland-Pilain	111	51	4	L...	C'case...	Fix.	70x125	2.75x4.92	1.7	115	10	Ther....	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Unit E.	R.....	Bev.....	765x105	Disk....	½-El...	Tr.-R.....
Rolland-Pilain	118	52	4	L...	C'case...	Fix.	74x130	2.91x5.12	1.7	136	12	Ther....	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Unit E.	R.....	Sp. Bev...	815x105	Disk....	½-El...	Fr.-R.....
Rolland-Pilain	133	54	4	I...	C'case...	Det.	95x140	3.74x5.51	1.4	242	18	Ther....	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Unit E.	R.....	Sp. Bev...	880x120	Disk....	½-El...	Fr.-R.....
Roy	110	44	4	L...	C'case...	Fix.	70x100	2.75x3.94	1.4	94	10	Ther....	Press....	Zenith....	Grav..	Mag.....	2-Unit.....	Cone....	3	Amid...	R.....	Bev.....	760x90	Disk....	½-El...	R.....
Roy	128	53	4	L...	C'case...	Fix.	85x130	3.35x5.12	1.5	179	14	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R.....	Bev.....	815x105	Disk....	½-El...	Tr.-R.....
Salmson	102	40	4	I...	C'case...	Det.	62x90	2.44x3.54	1.4	66	8	Ther....	Circ....	Zenith....	Grav..	Mag.....	None.....	Plate...	3	Unit E.	R.....	Bev.....	650x65	Wire....	½-El...	Tr.-R.....
S. C. A. P.	118	52	4	L...	C'case...	Fix.	76x130	2.99x5.12	1.7	144	12	Pump...	Press....	Claudel...	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R.....	Sp. Bev...	815x105	Disk....	Platef...	Tr.-R.....
Schneider, Th.	125	55	4	L...	C'case...	Det.	82.5x140	3.25x5.52	1.7	183	14	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Plate...	4	Amid...	R.....	Sp. Bev...	875x105	Steel....	½-El...	Tr.-R.....
Schneider, Th.	136	55	6	L...	C'case...	Det.	82.5x140	3.25x5.52	1.7	275	30	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Plate...	4	Unit E.	R.....	Sp. Bev...	880x120	Steel....	Cant....	Tr.-R.....
Secq. Hoyau	114	54	4	L...	C'case...	Fix.	60x110	2.36x4.33	1.8	75	10	Ther....	Press....	Claudel...	Vac...	Mag.....	2-Unit.....	Plate...	4	Amid...	R.....	Sp. Bev...	710x90	Wire....	½-El...	Tr.-R.....
Sidéa	107	43	4	L...	C'case...	Fix.	69x100	2.72x3.94	1.4	91	9	Ther....	Circ....	Zenith....	Grav..	Mag.....	1-Unit.....	Disk....	4	Amid...	R.....	Bev.....	760x90	Disk....	½-El...	R.....
Sigma	113	45	4	L...	C'case...	Fix.	65x120	2.56x4.72	1.8	97	10	Ther....	Circ....	Zenith....	Grav..	Mag.....	.....	Cone....	4	Amid...	R.....	Bev.....	760x90	Disk....	½-El...	Tr.-R.....
Sizaire Berwick	135	55	4	L...	C'case...	Fix.	95x160	3.74x6.30	1.7	277	20	Pump...	Press....	Cozette...	Vac...	Mag.....	2-Unit.....	Plate...	4	Amid...	R.....	Bev.....	.....	Wire....	½-El...	Tr.-R.....
Slim	109	54	4	I...	C'case...	Det.	65x130	2.56x5.12	2	105	12	Pump...	Press....	Zenith....	Vac...	Mag.....	1-Unit.....	Cone....	4	Unit A..	R.....	Bev.....	765x105	Disk....	¾-El...	Fr.-R.....
Soriano-Pedroso	100	44	4	L...	C'case...	Fix.	65x120	2.56x4.72	1.8	97	8	Ther....	Press....	Zenith....	Grav..	Mag.....	Lighting.....	Cone....	4	Amid...	R.....	Bev.....	710x90	Wire....	¼-El...	R.....
Suère	112	48	4	L...	C'case...	Det.	70x120	2.75x4.72	1.7	122	10	Ther....	Press....	Lachar....	Grav..	Mag.....	1-Unit.....	Cone....	3	Unit E.	C.....	Sp. Bev...	760x90	Disk....	½-El...	R.....
Talbot-Darracq	118	49	4	I...	C'case...	Det.	66x120	2.60x4.72	1.8	100	10	Pump...	Press....	Claudel...	Vac...	Delco.....	3-Unit.....	Plate...	3	Unit E.	C.....	Sp. Bev...	765x105	Wood...	Cant....	R.....
Talbot-Darracq	124	51	4	L...	C'case...	Fix.	85x130	3.35x5.12	1.5	179	14	Pump...	Press....	Smith.....	Vac...	Mag.....	2-Unit.....	Plate...	4	Amid...	R.....	Worm.....	820x120	Wood...	Cant....	Tr.-R.....
Talbot-Darracq	138	34	8	L...	C'case...	Det.	75x130	2.95x5.12	1.7	278	20	Pump...	Press....	Smith.....	Vac...	Delco.....	2-Unit Delco...	Plate...	4	Unit E.	C.....	Sp. Bev...	835x135	Disk....	Cant....	Fr.-R.....
Turcat-Méry	129	56	4	L...	C'case...	Fix.	80x150	3.15x5.90	1.8	183	25	Pump...	Press....	Zenith....	Grav..	Mag.....	2-Unit.....	Cone....	4	Unit E.	R.....	Sp. Bev...	820x120	Disk....	½-El...	Tr.-R.....
Unic	106	53	4	L...	C'case...	Fix.	65x110	2.56x4.33	1.6	89	10	Ther....	Press....	Own.....	Grav..	Mag.....	None.....	Cone....	4	Amid...	R.....	Sp. Bev...	815x105	Disk....	¾-El...	Tr.-R.....
Unic	125	54	4	L...	C'case...	Fix.	80x130	3.15x5.12	1.6	160	15	Pump...	Press....	Own.....	Vac...	Mag.....	S.E.V.....	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Wire....	Db.Cant	Tr.-R.....
Vermorel	112	51	4	L...	C'case...	Fix.	70x110	2.75x4.33	1.6	103	8	Ther....	Press....	Zenith....	Vac...	Mag.....	1-Unit.....	Cone....	4	Unit E.	C.....	Sp. Bev...	765x105	Disk....	½-El...	Tr.-R.....
Vermorel	122	55	4	L...	C'case...	Fix.	74x130	2.91x5.12	1.7	135	12	Ther....	Circ....	Zenith....	Vac...	Mag.....	2-Unit S.E.V...	Cone....	4	Unit E.	C.....	Bev.....	815x105	Steel....	Cant. & ¼-El	Fr.-Tr.-R
Vinot-Deguingand	118	51	4	I...	C'case...	Fix.	70x120	2.75x4.72	1.7	113	12	Pump...	Circ....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R.....	Bev.....	765x105	Disk....	½-El...	Tr.-R.....
Vinot-Deguingand	117	53	4	L...	C'case...	Fix.	80x130	3.15x5.12	1.6	159	14	Pump...	Press....	Zenith....	Vac...	Mag.....	1-Unit.....	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Disk....	½-El...	Tr.-R.....
Vinot-Deguingand	117	53	4	I...	C'case...	Fix.	80x130	3.15x5.12	1.6	159	14	Pump...	Press....	Zenith....	Vac...	Mag.....	1-Unit.....	Cone....	4	Amid...	R.....	Sp. Bev...	820x120	Disk....	½-El...	Tr.-R.....
Voisin	111	41	4	Sl...	C'case...	Det.	60x110	2.36x4.33	1.8	76	10	Ther....	Circ....	Zenith....	Grav..	Mag.....	1-Unit.....	Disk....	3	Unit E.	C.....	Sp. Bev...	765x105	Disk....	½-El...	R.....
Voisin	136	56	4	Sl...	C'case...	Det.	95x140	3.74x5.51	1.5	242	18	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Plate...	4	Unit E.	R.....	Sp. Bev...	880x120	Disk....	Cant....	R.....
Voisin	136	56	4	Sl...	C'case...	Det.	95x140	3.74x5.51	1.5	242	18	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Plate...	4	Unit E.	R.....	Sp. Bev...	880x120	Disk....	½-El...	R.....
Voisin	150	56	12	Sl...	C'case...	Det.	80x120	3.15x4.72	1.5	442	40	Pump...	Circ....	Zenith....	Vac...	Delco.....	Delco.....	Plate...	3	Unit E.	C.....	Sp. Bev...	895x135	Disk....	½-El...	Fr.-Tr.-R
Zebre	80	39	1	L...	C'case...	Fix.	88x106	3.46x4.13	1.2	39	6	Ther....	Circ....	Zenith....	Grav..	Mag.....	None.....	Plate...	3	Amid...	R.....	Bev.....	700x80	Wire....	½-El...	Tr.-R.....
Zebre	99	44	4	L...	C'case...	Fix.	55x105	2.16x4.13	1.9	61	8	Ther....	Press....	Zenith....	Grav..	Mag.....	2-Unit.....	Plate...	4	Unit E.	C.....	Bev.....	710x90	Wire....	Cant....	Tr.-R.....
Zedel	113	51	4	L...	C'case...	Fix.	70x120	2.75x4.72	1.7	113	10	Ther....	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	...	Unit E.	R.....	Sp. Bev...	760x90	Wood...	½-El...	Tr.-R.....
Zedel	117	48	4	L...	C'case...	Fix.	82x130	3.23x5.12	1.5	167	13	Pump...	Press....	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E.	R.....	Bev.....	820x120	Steel....	½-El...	Tr.-R.....

Abbreviations—Valve Location: **L,** valves both on one side; **1,** valves in head; **Sl,** sleeve valves. **Camshaft location: Cc,** in base chamber, with valve operation by pushrods; **H,** overhead. **Lubricating system: Press.,** full pressure with hollow Crankshaft; **Circ.,** pump circulating type, without hollow crankshaft; **Fuel Feed: Vac.,** Vacuum; **Press.,** Pressure; **Grav.,** Gravity. **Gearset location: Amid.,** gearbox mounted independently of engine; **Unit E,** gearbox unit with engine; **Unit A,** gears in rear axle. **Ignition: Mag.,** Magneto; **Bat.,** Battery. **Wheels: Steel,** steel spoke wheels. **Brake location: Fr.,** on front wheels; **Tr,** on transmission; **R,** on rear wheels.

Specifications of Continental European Passenger Car Chassis—1922

Nationality Make and Model	Wheelbase, Ins.	No. of Cylinders	Revolutions Per Minute	Brake Horse Power	BORE AND STROKE			Piston Displacement (Cu In.)	Camshaft Drive	Valve Location	Cooling	Type of Lubricating System	Make of Carbureter	Fuel Feed	Ignition Make	Electric System	Clutch Type	No. Forward Speeds	Gearset Location	Final Drive	Torque Taken By	Type of Steering Gear	Tire Size (Mm.)	Type of Wheels	Type of Rear Springs	BRAKE LOCATION		Chasis Weight (Lbs.)
					Mm.	Ins.	Ratio																			Hand	Foot	
GERMAN																												
Adler 6-18	104	4	2000	18	67x110	2.64x4.33	1.49	95	Chan.	L.	Ther.	Pres.	Zenith	P	Eise	Bosch	Cone	3	Amid.	Bevl	T-T.	Worm.	760x100	Wire	½-E.	R.	Tr.	1320
Adler 9-24	119	4	2000	25	79x118	3.11x4.65	1.49	141	Chan.	L.	Pump.	Pres.	Zenith	P	Bosch	Bosch	Cone	4	Unit E.	Bevl	T-T.	Serw.	820x120	Wire	½-E.	R.	Tr.	2160
Adler 12-34	134	4	1800	42	86x135	3.38x5.32	1.57	191	Spur.	L.	Pump.	Pres.	Pallas	V	Bosch	Bosch	Cone	4	Unit E.	S-B	T-T.	Serw.	880x125	Wire	½-E.	R.	Tr.	2650
Adler 18-48	134	4	1800	60	100x150	3.94x5.91	1.50	287	Spur.	L.	Pump.	Pres.	Pallas	V	Bosch	Eise	Cone	4	Unit E.	S-B	T-T.	Serw.	930x135	Wire	½-E.	R.	Tr.	2770
Aga 6-20	101	4	2800	20	64x110	2.52x4.33	1.72	86	Spur.	L.	Ther.	Spl.	Own	V	Bosch	Bosch	Cone	3	Unit E.	S-B	Spr	Worm.	760x100	Opt	½-E.	R.	Tr.	1150
Apollo 4-14	80	4	2000	14	60x92	2.36x3.62	1.53	64	Spur.	I.	Ther.	Spl.	Opt	G	Eise	Bosch	Cone	3	Amid.	Bevl	Spr	Rack.	660x 75	Wood	Cant.	R.	Tr.	993
Apollo 10-30	91	4	2000	30	82x116	3.23x4.56	1.41	149	Spur.	L.	Ther.	Spl.	Opt	P	Eise	Eise	Cone	4	Amid.	Bevl		Worm.	820x120	Steel	Cant.	R.	Tr.	1980
Apollo 12-45	91	8	2000	45	70x100	2.75x3.94	1.43	188	Spur.	I.	Ther.	Pres.	Opt	P	Eise	Fenag	Cone	4	Amid.	Bevl		Worm.	820x120	Wire	Cant.	R.	Tr.	1980
Audi K	139	4	2200	50	90x140	3.54x5.51	1.56	217	Heli.	I.	Ther.	Pres.	Zenith	P	Bosch	Bosch	Cone	4	Unit E.	S-B	T-T.	Serw.	895x135	Opt	½-E.	R.	Tr.	2650
Beckmann 8-24	122	4	1800	24	76x110	2.99x4.33	1.45	122	Spur.	I.	Ther.	Pres.	Zenith	V	Bosch	Bosch	Cone	4	Amid.	Bevl		Worm.	815x105	Wood	½-E.	R.	Tr.	1760
Beckmann 10-30	132	4	1800	30	82x120	3.23x4.73	1.46	155	Spur.	I.	Ther.	Pres.	Zenith	V	Bosch	Bosch	Cone	4	Amid.	Bevl		Worm.	820x120	Wood	½-E.	R.	Tr.	1980
Benz 8-20	112	4	2000	20	74.5x120	2.93x4.73	1.61	171	Chan.	L.	Ther.	Pres.	Zenith	P	Eise	Bosch	Cone	4	Amid.	Bevl	T-T.	Serw.	815x105	Opt	½-E.	R.	Tr.	1720
Benz 10-30	123	4	2200	30	80x130	3.15x5.12	1.62	159	Chan.	L.	Ther.	Pres.	Zenith	P	Bosch	Bosch	Cone	4	Amid.	Bevl	T-T.	Serw.	820x120	Opt	½-E.	R.	Tr.	1980
Benz 14-30	124	4	1850	30	90x140	3.54x5.51	1.56	217	Chan.	L.	Pump.	Pres.	Zenith	P	Bosch	Bosch	Cone	4	Amid.	Bevl	T-T.	Serw.	880x120	Opt	½-E.	R.	Tr.	2210
Benz 16-50	137	6	1950	50	80x138	3.13x5.43	1.72	254	Chan.	L.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Cone	4	Amid.	Bevl	T-T.	Serw.	880x135	Opt	½-E.	R.	Tr.	2430
Benz 27-70	144	6	1550	70	100x150	3.94x5.91	1.50	432	Chan.	L.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Cone	4	Amid.	Bevl	T-T.	Serw.	935x135	Opt	Cant.	R.	Tr.	3200
Benz Soehne 8-25	120	4	2000	20	75x120	2.95x4.73	1.60	129	Chan.	L.	Ther.	Pres.	Zenith	V	Bosch	Opt	Cone	4	Amid.	Bevl	Spr	Serw.	815x105	Wood	¾-E.	R.	Tr.	1670
Benz Soehne 14-42	127	4	1800	42	90x140	3.54x5.51	1.56	217	Heli.	L.	Ther.	Pres.	Zenith	V	Bosch	Bosch	Cone	4	Amid.	Bevl		Serw.	880x135	Wood	½-E.	R.	Tr.	2160
Bergmann 10-30	118	4	.....	30	80x130	3.15x5.12	1.62	159	Chan.	L.	Ther.	Pres.	Favorit	P	Bosch	Bosch	Cone	4	Amid.	Bevl	T-T.	Worm.	.....	Opt	½-E.	R.	Tr.	2050
Bergmann 19-55	140	4	.....	55	102x150	4.02x5.91	1.47	300	Chan.	L.	Ther.	Pres.	Favorit	P	Bosch	Bosch	Exp	4	Amid.	Bevl	T-A.	Worm.	.....	Opt	½-E	R.	Tr.	2710
Bob 4-10	89	4	1600	10	60x90	2.36x3.54	1.50	62	Spur.	L.	Ther.	Pres.	Pallas	G	Sieme.	Opt	Cone	3	Amid.	Bevl	T-T.	Worm.	710x 90	Wire	¾-E.	R.	Tr.	772
Brennabor P-IV	125	4	2000	24	80x104	3.15x4.09	1.30	128	Spur.	L.	Ther.	Pres.	Opt	P	Opt	Bosch	Cone	4	Amid.	Bevl	T-T.	Worm.	815x105	Wood	½-E.	R.	Tr.	2430
Brennabor S	102	4	2000	20	70x102	2.75x4.02	1.46	96	Heli.	I.	Pump.	Spl.	Pallas	G	Bosch	Bosch	Plate	3	Unit E.	Bevl	T-T.	Serw.	700x 90	Wood	Cant.	R.	R.	1540
Daimler-Mercedes 6-20	108	4	.....	20	68x108	2.68x4.25	1.59	96	.....	I.	Pump.	Spl.	Own	P	Bosch	Bosch	Cone	4	Amid.	D-B	T-T.	Serw.	760x100	Opt	½-E.	R.	Tr.	.....
Daimler-Mercedes 10-35	120	4	.....	35	80x130	3.15x5.12	1.62	159	.....	I.	Pump.	Spl.	Own	P	Bosch	Bosch	D-Cone	4	Amid.	D-B	T-T.	Serw.	820x120	Opt	½-E.	R.	Tr.	.....
Daimler-Mercedes 16-45	127	4	.....	45	100x130	3.94x5.12	1.30	249	.....	S.	Pump.	Spl.	Own	P	Bosch	Bosch	D-Cone	4	Amid.	D B	T-T.	Serw.	820x135	Opt	½-E.	R.	Tr.	.....
Daimler-Mercedes 28-95	133	6	.....	95	105x140	4.13x5.51	1.33	443	.....	I.	Pump.	Pres.	Own	P	Bosch	Bosch	D-Cone	4	Amid.	D-B	T-T.	Serw.	895x135	Opt	½-E.	R.	Tr.	.....
Dinos 8-35	115	4	2500	35	78x108	3.07x4.25	1.38	126	Bevl.	I.	Pump.	Pres.	Pallas	V	Tria	Tria	Cone	4	Unit E.	Bevl	T-T.	Serw.	815x105	Wire	½-E.	R.	Tr.	1650
Dixi 6-18	112	4	2200	18	70x102	2.75x4.02	1.46	96	Chan.	L.	Ther.	Pres.	Opt	G	Bosch	Opt	Cone	4	Amid.	Bevl	T-T.	Serw.	710x100	Wire	Cant.	R.	Tr.	1210
Dixi 8-24	112	4	1800	24	75x120	2.95x4.73	1.60	123	Spur.	L.	Pump.	Pres.	Opt	P	Bosch	Opt	Cone	4	Amid.	Bevl	T-T.	Serw.	815x105	Wood	½-E.	R.	Tr.	1760
Dixi 13-39	126	4	1500	39	95x120	3.74x4.73	1.26	124	Spur.	L.	Pump.	Pres.	Opt	P	Bosch	Opt	Cone	4	Amid.	Bevl	T-T.	Serw.	820x120	Wood	¾-E.	R.	Tr.	2210
Dixi 20-55	144	4	1800	55	100x165	3.94x6.49	1.65	316	Chan.	L.	Pump.	Pres.	Opt	P	Bosch	Opt	Cone	4	Amid.	Bevl	T-T.	Worm.	935x120	Opt	¾-E.	R.	Tr.	3200
Duerkopp P8	112	4	2000	24	82x100	3.23x3.94	1.22	129	Spur.	L.	Ther.	Spl.	Opt	P	Bosch	Opt	Cone	4	Amid.	S-B	T-T.	Worm.	815x105	Wood	½-E.	R.	Tr.	1540
Duerkopp P10	129	4	2000	30	91x100	3.58x3.94	1.10	175	Spur.	L.	Ther.	Spl.	Opt	P	Bosch	Opt	Cone	4	Amid.	S-B	T-T.	Worm.	820x120	Wood	½-E.	R.	Tr.	1980
Duerkopp P16	137	4	1800	45	101x130	3.97x5.12	1.29	254	Spur.	L.	Pump.	Spl.	Opt	V	Bosch	Opt	Cone	4	Amid.	S-B	T-T.	Worm.	880x125	S-Disk.	½-E.	R.	Tr.	2860
Duerkopp P24	146	6	1800	70	101x130	3.97x5.12	1.29	381	Spur.	L.	Pump.	Spl.	Opt	V	Bosch	Opt	Cone	4	Amid.	S-B	T-T.	Worm.	935x135	S-Disk.	½-E.	R.	Tr.	3300
Dux S	138	4	1800	50	100x140	3.94x5.51	1.40	268	Chan.	L.	Pump.	Pres.	Zenith	P	Bosch	Bosch	Cone	4	Amid.	S-B	T-T.	Serw.	895x135	Wood	½-E.	R.	Tr.	3040
Ehrhardt L40	131	4	1800	40	80x130	3.15x5.12	1.62	159	Heli.	I.	Pump.	Pres.	Pallas	V	Bosch	Fenag	Disk	4	Amid.	S-B	T-A.	Worm.	820x120	Wire	Cant.	R.	Tr.	1980
Ehrhardt L50	143	6	1800	50	80x130	3.15x5.12	1.62	239	Heli.	I.	Pump.	Pres.	Pallas	V	Bosch	Fenag	Disk	4	Amid.	S-B	T-A.	Worm.	880x120	Wire	Cant.	R.	Tr.	2430
Elite S55	144	6	1950	55	85x140	3.45x5.51	1.65	290	Chan.	L.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Disk	4	Amid.	S-B	T-T.	Serw.	880x135	Opt	Cant.	R.	Tr.	2780
Elite E12	125	4	2000	42	85x140	3.45x5.51	1.65	194	Chan.	L.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Disk	4	Amid.	S-B	T-T.	Serw.	820x120	Opt	Cant.	R.	Tr.	2540
Fafnir 476	117	4	1700	28	76x125	2.99x4.92	1.64	138	Chan.	L.	Ther.	Pres.	Pallas	G	Bosch	Eise	Cone	4	Unit E.	Bevl	T-T.	Worm.	815x105	Steel	Cant.	R.	Tr.	1650
Falcon 6-20	99	4	2200	20	65x110	2.56x4.33	1.69	89	Heli.	L.	Ther.	Spl.	Solex	G	Eise	Eise	Disk	4	Unit E.	Bevl		Worm.	710x 90	Wood	Cant.	R.	R.	1490
Faun 6-22	114	4	1800	22	64x110	2.52x4.33	1.72	86	Heli.	I.	Ther.	Pres.	Pallas	G	Bosch	Own	Disk	3	Unit E.	Bevl	Spr	Worm.	760x 90	S-Disk.	Cant.	R.	R.	1210
Fulmina 10-30	118	4	2200	30	80x125	3.15x4.92	1.56	153	Chan.	L.	Ther.	Pres.	Pallas	V	Bosch	Bosch	Disk	4	Amid.	Bevl	T-A.	Serw.	820x120	Wood	D-Can.	R.	Tr.	1650
Fulmina 16-45	134	4	1850	47	100x130	3.94x5.12	1.30	249	Chan.	L.	Ther.	Pres.	Pallas	V	Bosch	Bosch	Disk	4	Amid.	Bevl	T-A.	Serw.	880x135	Wood	D-Can.	R.	Tr.	2430
Grade 4-12	110	1	1600	12	95x120	3.74x4.73	1.26	518	.....	2.	Air	Spl	Own	G	Bosch		Fr			Chn	Spr	Dret.	710x 90	S-Disk.	¼-E.	R.	R.	772
Hansa-Lloyd H50	150	4	2200	50	100x130	3.94x5.12	1.30	249	Chan.	L.	Ther.	Pres.	Pallas	V	Mea	Bosch	Disk	4	Amid.	Bevl	T-T.	Serw.	935x135	Steel	½-E.	R.	Tr.	3090
Hansa-Varel F32	134	4	2500	34	88x104	3.46x4.09	1.18	154	Chan.	L.	Ther.	Pres.	Pallas	V	Bosch	Bosch	Disk	4	Amid.	Worm	T-T.	Serw.	820x135	Steel	Plat	R.	Tr.	2870
Hansa-Varel P26	117	4	2400	28	78x110	3.07x4.33	1.41	128	Chan.	L.	Ther.	Pres.	Pallas	V	Bosch	Bosch	Disk	4	Amid.	Worm	T-T.	Serw.	765x105	Steel	Plat	R.	Tr.	2090
Heim 6-20	114	4	2600	26	71x100	2.79x3.94	1.41	97	Chan.	L.	Ther.	Pres.	Pallas	G	Bosch	Bosch	Cone	3	Amid.	Bevl	Spr	Serw.	765x105	Wire	¾-E.	R.	Tr.	1540
Heim 8-30	118	4	2600	31	80x100	3.15x3.94	1.25	123	Chan.	L.	Ther.	Pres.	Pallas	G	Bosch	Bosch	Cone	3	Amid.	Bevl	Spr	Serw.	765x105	Wire	¾-E.	R.	Tr.	1650
Horch 10-30	127	4	2000	30	80x130	3.15x5.12	1.62	159	Heli.	L.	Pump.	Pres.	Pallas	V	Bosch	Bosch	Disk	4	Unit E.	S-B	T-T.	Worm.	820x120	Steel	Di-Ca.	R.	R.	2090
Horch 15-50	146	6	2000	50	80x130	3.15x5.12	1.62	239	Heli.	I.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Disk	4	Unit E.	S-B	T-T.	Worm.	880x135	Steel	Di-Ca.	R.	R.	2870
Horch 18-50	139	4	1800	50	100x150	3.94x5.91	1.50	287	Chan.	L.	Pump.	Pres.	Pallas	V	Bosch	Bosch	Cone	4	Amid.	S-B	T-R.	Serw.	935x135	Steel	½-E.	R.	Tr.	2430
Horch 25-60	139	4	1600	60	115x155	4.53x6.11	1.35	393	Chan.	L.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Cone	4	Amid.	S-B	T-R.	Serw.	935x135	Wood	½-E.	R.	Tr.	2650
Joswin 25-75	145	6	1400	75	99x140	3.89x5.51	1.42	394	.....	I.	Pump.	Pres.	Zenith	V	Bosch	Fenag	Disk	4	Amid.	Bevl	T-T.	Serw.	935x150	Wire	½-E.	R.	Tr.	3970
Kleinautobau Greiz S5	79	4	2500	14	64x100	2.52x3.94	1.56	78	Spur.	L.	Ther.	Spl	Solex	G	Bosch	Eise	Cone	3	Amid.	Bevl	T-T.	Worm.	710x 90	Wire	½-E.	R.	Tr.	772
Keco IV	.....	2	1800	12	85x90	3.45x3.54	1.06	62	Spur.	H.	Ther.	Spl	Pallas	G	Bosch		Cone	2	Pintr.	Chn		Worm.	700x 80	Wire	2-Spi.	R.	R.	840
Ley S12	136	6	2200	40	80x104	3.15x4.09	1.30	191	Heli.	L.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Disk	4	Unit E.	S-B	T-T.	Worm.	820x125	Wire	½-E.	R.	Tr.	2320
Ley T6	105	4	2200	16	70x100	2.75x3.94	1.43	94	Heli.	L.	Ther.	Spl.	Zenith	G	Eise	Eise	Disk	3	Unit E.	Bevl	T-T.	Serw.	760x 90	Wire	Cant.	R.	Tr.	1210
Ley U12	125	4	2200	32	87x130	3.43x5.12	1.49	188	Heli.	L.	Pump.	Pres.	Zenith	G	Bosch	Bosch	Disk	4	Unit E.	S-B	T-T.	Worm.	880x125	Wire	Cant.	R.	Tr.	2090
M. A. F. G6	104	4	1700	18	72x96	2.84x3.78	1.33	95	Spur.	F.	Air	Spl	Pallas	G	Bosch		Cone	4	Amid.	Bevl	Spr	Worm.	760x100	Wood	½-E.	R.	Tr.	1320
M. A. F. G8	114	4	1700	25	78x110	3.07x4.33	1.41	128	Spur.	F.	Air	Pres.	Pallas	G	Bosch	Bosch	Cone	4	Amid.	Bevl	Spr	Worm.	765x105	Wood	½-E.	R.	Tr.	1650
Maybach 22-70	144	6	2200	70	95x135	3.74x5.32	1.42	350	Spur.	L.	Pump.	Pres.	Own	V	Bosch	Bosch	Cone	1	Unit E.	S-B	T-T.	Serw.	895x135	S-Disk.	½-E.	fR.	fR.	2850
N. A. G 10-30	126	4	2300	35	83x118	3.27x4.65	1.42	156	Chan.	L.	Ther.	Pres.	Pallas	P	Bosch	Bosch	Cone	4	Amid.	S-B	T-T.	Serw.	820x120	Wood	½-E.	R.	Tr.	2230
N. A. G 11-45	130	4	2300	48	83x132	3.27x5.19	1.59	174	Chan.	I.	Pump.	Pres.	Zenith	V	Bosch	Bosch	Plat	4	Amid.	S-B	T-R.	Serw.	820x135	Steel	Cant.	R.	R.	2110
N. S. U 5-15	99	4	1600	15	66x90	2.59x3.54	1.36	75	Spur.	L.	Ther.	Pres.	Zenith	P	Bosch	Eise	Cone	3	Amid.	Bevl	Spr	Serw.	700x 85	Wood	½-E.	R.	Tr.	1230
N. S. U 8-24	118	4	1500	24	78x110	3.07x4.33	1.41	128	Spur.	L.	Ther.	Pres.	Zenith	P	Bosch	Bosch	Disk	4	Amid.	Bevl	Spr	Serw.	815x105	Wood	Cant.	R.	Tr.	1760
N. S. U 14-40	126	4	1400	40	84x130	3.01x5.12	1.55	176	Spur.	L.	Ther.	Pres.	Zenith	P	Bosch	Bosch	Disk	4	Amid.	Bevl	Spr	Serw.	880x120	Wood	Cant.	R.	Tr.	2430

N. U. G.	3. 8-15	87	4	2400	15	60x 90	[2.36x3.54	1.50	62	Spur..	F...	Ther....	Spl...	Pallas.....	G....	Sieme..	.....	Plat....	3	Unit A..	Bevl.....	T-T..	Worm..	710x100	S-Disk..	¼-E....	R..	R..	1100
Opel	30-75	148	6	1400	75	105x150	4.13x5.91	1.43	476	Heli...	L...	Pump...	Pres..	Own.....	P....	Bosch..	Bosch..	Cone....	4	Amid...	S-B.....	T-T..	Scrw...	935x135	Steel....	Cant....	R...	Tr..	....
Opel	21-50	138	6	1400	50	96x130	3.78x5.12	1.35	344	Heli...	L...	Pump...	Pres..	Own.....	P....	Bosch..	Bosch..	Cone....	4	Amid...	S-B.....	T-T..	Scrw...	895x135	Steel....	Cant....	R...	Tr..	....
Opel	14-38	131	4	1800	38	90x135	3.54x5.32	1.50	210	Heli...	L...	Pump...	Pres..	Own.....	P....	Bosch..	Bosch..	Cone....	4	Amid...	S-B.....	T-T..	Worm..	880x120	Steel....	½-E....	R...	Tr..	....
Opel	9-25	124	4	1800	25	78x122	3.07x4.81	1.56	142	Heli...	L...	Pump...	Pres..	Own.....	P....	Bosch..	Bosch..	Cone....	4	Amid...	S-B.....	T-T..	Worm..	820x120	Steel....	½-E....	R...	Tr..	....
Phaenomen	10-30	128	4	1800	30	80x130	3.15x5.12	1.62	159	Chan..	L...	Ther....	Spl...	Pallas.....	V....	Bosch..	Bosch..	Cone....	4	Amid...	Bevl.....	T-T..	Scrw...	820x120	Wood....	½-E....	R...	Tr..	2540
Phaenomen	16-45	128	4	1800	45	97x140	3.82x5.51	1.44	252	Chan..	L...	Pump...	Spl...	Pallas.....	V....	Bosch..	Bosch..	Cone....	4	Amid...	Bevl.....	T-T..	Scrw...	820x125	Wire....	½-E....	R...	Tr..	2780
Presto	D	122	4	2000	30	78x123	3.07x4.84	1.58	143	Spur..	L...	Ther....	Spl...	Opt.....	P....	Bosch..	Bosch..	Disk....	4	Amid...	S-B.....	T-T..	Scrw...	820x120	Wire....	½-E....	R...	Tr..	1980
Protos	C10-30	126	4	2200	30	80x130	3.15x5.12	1.62	159	Chan..	L...	Ther....	Pres..	Zenith.....	P....	Sieme..	Bosch..	Disk....	4	Amid...	S-B.....	T-T..	Worm..	820x135	Steel....	½-E....	R...	Tr..	2430
Richard & Hering	10-28	127	4	1400	28	77x140	3.03x5.51	1.82	159	Heli...	L...	Pump...	Pres..	Zenith.....	V....	Bosch..	Bosch..	Cone....	4	Unit E..	Bevl.....	T-T..	Scrw...	820x120	Wood....	½-E....	R...	Tr..	2210
Richard & Hering	13-35	127	4	1400	35	85x140	3.35x5.51	1.65	194	Heli...	L...	Pump...	Pres..	Zenith.....	V....	Bosch..	Bosch..	Cone....	4	Unit E..	Bevl.....	T-T..	Scrw...	820x120	Wire....	½-E....	R...	Tr..	2210
Rumpler	CA104	114	6	2200	36	74x100	2.92x3.94	1.35	157	Heli...	I...	Pump...	Pres..	Pallas.....	G....	Bosch..	Bosch..	Disk....	3	Unit A..	Bevl.....	.....	Scrw...	880x120	S-Disk..	Cant....	R...	Tr..	1870
Selve	SL6	118	4	2500	28	71x100	2.79x3.94	1.41	97	Chan..	L...	Ther....	Pres..	Pallas.....	G....	Bosch..	Bosch..	Cone....	4	Amid...	S-B.....	T-T..	Worm..	765x105	Wire....	Cant....	R...	Tr..	1870
Selve	SL8	118	4	2500	36	82x100	3.23x3.94	1.22	129	Chan..	L...	Ther....	Pres..	Zefan.....	G....	Bosch..	Bosch..	Cone....	4	Amid...	S-B.....	T-T..	Worm..	820x120	Wire....	Cant....	R...	Tr..	1980
Simson	B	104	4	1500	18	70x102	2.75x4.02	1.46	95	Chan..	L...	Ther....	Spl...	Zenith.....	O....	Bosch..	Bosch..	Cone....	4	Amid...	Bevl.....	T-T..	Worm..	765x105	Opt.....	½-E....	R...	Tr..	1590
Simson	C	122	4	1800	30	80x130	3.15x5.12	1.62	159	Chan..	L...	Ther....	Spl...	Zenith.....	O....	Bosch..	Bosch..	Disk....	4	Amid...	Bevl.....	T-T..	Worm..	815x120	Opt.....	½-E....	R...	Tr..	2090
Simson	D	122	4	1800	45	90x140	3.54x5.51	1.56	217	Chan..	L...	Pump...	Spl...	Zenith.....	O....	Bosch..	Bosch..	Disk....	4	Amid...	Bevl.....	T-T..	Worm..	820x135	Opt.....	½-E....	R...	Tr..	2330
Steiger	P.A.	118	4	2200	45	72x160	2.84x6.29	2.22	154	Bevl..	J...	Pump...	Spl...	Zenith.....	V....	Bosch..	Bosch..	Plat....	4	Unit E..	S-B.....	T-T..	Scrw...	820x120	Wire....	Cant....	R...	Tr..	2320
Stoewer	D3	116	4	2000	24	75x120	2.95x4.73	1.60	129	Chan..	L...	Pump...	Pres..	Pallas.....	V....	Bosch..	Bosch..	Cone....	4	Amid...	Bevl.....	T-T..	Scrw...	815x105	Wood....	½-E....	R...	Tr..	1980
Stoewer	D5	131	6	2000	36	75x118	2.95x4.65	1.57	191	Chan..	L...	Pump...	Pres..	Pallas.....	V....	Bosch..	Bosch..	Cone....	4	Amid...	Bevl.....	T-T..	Scrw...	820x125	Wood....	½-E....	R...	Tr..	2320
Stoewer	D7	140	6	1400	120	130x140	5.12x5.51	1.08	680	Bevl..	I...	Pump...	Pres..	Zenith.....	V....	Bosch..	Bosch..	Cone....	4	Amid...	Bevl.....	T-T..	Scrw...	935x150	S-Disk..	½-E....	R...	Tr..	3970
Szawe	10-50	137	6	2400	50	62x140	2.44x5.51	2.26	159	Bevl..	I...	Pump...	Pres..	Zenith.....	V....	Eise....	Eise....	Plat....	4	Unit E..	S-B.....	T-T..	Scrw...	880x120	Wire....	Cant....	R...	Tr..	1870
Wanderer	W8	95	4	2000	15	65x100	2.56x3.94	1.54	81	Chan..	I...	Pump...	Spl...	Own.....	G....	Bosch..	Bosch..	Cone....	3	Unit E..	S-B.....	T-T..	Scrw...	710x 90	Wire....	Cant....	R...	Tr..	927
Wanderer	W6	108	4	1800	18	67x110	2.64x4.33	1.64	95	Chan..	F...	Pump...	Spl...	Zenith.....	V....	Bosch..	Bosch..	Cone....	4	Unit E..	S-B.....	T-T..	Scrw...	760x100	Wire....	½-E....	R...	Tr..	1590

For abbreviations see page 345.

Nationality and Make	Wheelbase (In.)	Track (In.)	No. of Cylinders	Valve Location	Camshaft Location	Cylinder Head	BORE AND STROKE			Piston Displacement (Cu. In.)	H.P. (Nominal)	Cooling	Lubricating System	Carbureter Make	Fuel Feed	Ignition	Starting and Lighting	Clutch	Speeds	Gearset Location	Position of Levers	Final Drive	Tires Size (Mm.)	Wheels	Rear Springs	Brake Location
							Mm.	In.	Ratio																	
BELGIAN																										
Belga	108	49	4	L...	C'Case..	Fix.	65x120	2.5x4.7	1.8	97	10	Ther....	Press...	Zenith....	Grav..	Mag.....	None.....	Cone....	5	Fric....	R....	Bevel.....	760x90	Disk....	½-El...	R.....
d'Aoust	106	49	4	L...	C'Case..	Fix.	65x140	2.5x5.5	2.1	113	10	Ther....	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R....	Bevel.....	760x90	Wire....	½-El...	Tr.-R.....
d'Aoust	126	55	4	I...	Head...	Det.	89x120	3.5x4.7	1.4	182	20	Pump...	Press...	Zenith....	Vac...	2-Mag....	2-Unit.....	Disk....	4	Unit E..	R....	Bevel.....	880x120	Wire....	½-El...	Fr.-R.....
Dasse	118	49	4	L...	C'Case..	Fix.	75x120	2.9x4.7	1.5	129	12	Pump...	Circ....	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	3	Unit E..	C....	Spiral.....	760x90	Disk....	Cant....	R.....
Dasse	137	55	4	I...	Head...	Det.	90x140	3.5x5.5	1.5	218	30	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	3	Unit E..	C....	Spiral.....	895x135	Disk....	½-El...	Tr.-R.....
Excelsior	150	56	6	L...	C'Case..	Fix.	85x140	3.3x5.5	1.6	291	.....	Pump...	Press...	2-Claud..	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	C....	Spiral.....	895x135	Wire....	Cant....	Fr.-R.....
F. N.	108	49	4	L...	C'Case..	Fix.	62x110	2.4x4.3	1.6	81	10	Ther....	Circ....	Own.....	Vac...	Mag.....	1-Unit.....	Cone....	3	Unit E..	R....	Bevel.....	760x90	Wood....	½-El...	R.....
F. N.	123	55	4	L...	C'Case..	Fix.	85x120	3.3x4.7	1.4	166	16	Ther....	Press...	Own.....	Vac...	Mag.....	2-Unit.....	Disk....	4	Amid...	R....	Spiral.....	820x120	Wood....	½-El...	Tr.-R.....
F. N.	134	55	4	L...	C'Case..	Fix.	90x150	3.5x5.9	1.7	233	30	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Spiral.....	895x150	Wood....	½-El...	R.....
Imperia	130	52	4	L...	C'Case..	Fix.	80x180	3.1x7.0	2.2	214	20	Pump...	Press...	.....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Bevel.....	820x120	Wire....	½-El...	Tr.-R.....
Abadal	142	56	8	I...	Head...	Det.	80x140	3.1x5.5	1.7	344	40	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	C....	Bevel.....	895x135	Wire....	½-El...	Fr.-Tr.-R..
Metallurgique	126	52	4	L...	C'Case..	Fix.	80x130	3.1x5.1	1.6	160	14	Ther....	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	R....	Spiral.....	820x120	Wire....	½-El...	Tr.-R.....
Metallurgique	137	56	4	L...	C'Case..	Fix.	90x140	3.5x5.5	1.5	216	18	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	R....	Spiral.....	880x120	Wire....	½-El...	Tr.-R.....
Metallurgique	146	56	4	L...	C'Case..	Fix.	100x160	3.9x6.3	1.6	305	30	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	C....	Spiral.....	895x135	Wire....	½-El...	Fr.-Tr.-R..
Miesse	118	55	4	I...	Head...	Det.	69x130	2.7x5.1	1.8	119	12	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	3	Unit E..	C....	Spiral.....	815x105	Wire....	½-El...	R.....
Miesse	133	55	8	I...	Head...	Det.	69x130	2.7x5.1	1.8	237	25	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	3	Unit E..	C....	Spiral.....	895x135	Wire....	½-El...	R.....
Minerva	118	52	4	Sl..	C'Case..	Det.	75x112	2.9x4.4	1.5	121	15	Pump...	Circ....	Sthenos..	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	C....	Spiral.....	820x120	Wire....	Cant....	R.....
Minerva	134	55	4	Sl..	C'Case..	Det.	90x140	3.5x5.5	1.5	217	20	Pump...	Circ....	Sthenos..	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	R....	Spiral.....	895x135	Wire....	Cant....	Tr.-R.....
Minerva	142	55	6	Sl..	C'Case..	Det.	90x140	3.5x5.5	1.5	326	30	Pump...	Circ....	Sthenos..	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	R....	Spiral.....	895x135	Wire....	Cant....	Tr.-R.....
Nagant	114	51	4	I...	C'Case..	Det.	72x120	2.8x4.7	1.6	119	10	Ther....	Press...	Zenith....	Grav..	Mag.....	2-Unit.....	Plate....	4	Unit E..	C....	Spiral.....	765x105	Wood....	Cant....	Fr.-R.....
Nagant	130	52	4	I...	C'Case..	Fix.	80x150	3.1x5.9	1.9	184	16	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Spiral.....	880x120	Wood....	½-El...	Tr.-R.....
Pipe	130	54	4	L...	C'Case..	Fix.	80x150	3.1x5.9	1.9	184	20	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R....	Bevel.....	820x120	Wire....	½-El...	Tr.-R.....
Pipe	140	54	4	L...	C'Case..	Fix.	100x180	3.9x7.1	1.8	345	30	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R....	Bevel.....	880x120	Wire....	½-El...	Tr.-R.....
Pipe	152	54	4	L...	C'Case..	Fix.	120x200	4.7x7.8	1.7	552	40	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Cone....	4	Amid...	R....	Bevel.....	895x135	Wire....	½-El...	Tr.-R.....
P. M.	114	51	4	L...	C'Case..	Fix.	69.5x120	2.7x4.7	1.7	108	10	Ther....	Circ....	Claudel..	Grav..	Mag.....	2-Unit.....	Plate....	4	Unit E..	R....	Spiral.....	765x90	Disk....	½-El...	R.....
Semea	118	48	4	I...	Head...	Det.	69x133	2.7x5.2	1.9	121	12	Pump...	Press...	Zenith....	Grav..	Mag.....	2-Unit.....	Plate....	4	Unit E..	R....	Spiral.....	820x120	Wire....	½-El...	R.....
ITALIAN																										
Alfa-Romeo	114	56	4	L...	C'Case..	Fix.	102x130	4 x5.1	1.27	259	20	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	4	Amid...	R....	Bevel.....	820x120	Steel....	½-El...	Tr.-R.....
Alfa-Romeo	133	56	6	L...	C'Case..	Fix.	94x140	3. 7x5.5	1.48	356	35	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	4	Amid...	R....	Bevel.....	895x135	Steel....	Dbl. Ct.	Tr.-R.....
Alfa-Romeo	129	56	6	I...	Head...	Det.	75x110	2.95x4.3	1.4	178	20	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	C....	Bevel.....	820x120	Steel....	½-El...	Tr.-R.....
Ansaldo	108	51	4	I...	C'Case..	Det.	70x120	2.75x4.7	1.7	113	10	Pump...	Press...	Zenith....	Grav..	Mag.....	1-Unit.....	Disk....	3	Unit E..	C....	Sp. Bevel..	760x90	Steel....	½-El...	R.....
Bianchi	108	49	4	L...	C'Case..	Fix.	70x110	2.75x4.3	1.5	103	10	Ther....	Press...	Zenith....	Vac...	Mag.....	1-Unit.....	Plate....	4	Amid...	R....	Sp. Bevel..	765x105	Wood....	½-El...	R.....
Chiribiri	102	49	4	L...	C'Case..	Fix.	65x113	2.55x4.4	1.7	91	10	Ther....	Circ....	Zenith....	Grav..	Mag.....	1-Unit.....	Plate....	4	Unit A..	C....	Bevel.....	710x90	Disk....	½-El...	R.....
Diatto	98	43	4	L...	C'Case..	Fix.	60x90	2.36x3.5	1.5	62	10	Pump...	Press...	Zenith....	Grav..	Mag.....	2-Unit.....	Plate....	3	Amid...	C....	Bevel.....	710x90	Disk....	½-El...	R.....
Diatto	118	55	4	L...	C'Case..	Fix.	85x120	3.34x4.7	1.4	166	25	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disks....	4	Amid...	R....	Bevel.....	820x120	Wire....	½-El...	Tr.-R.....
Diatto	118	55	4	I...	Head...	Det.	80x100	3.14x3.9	1.25	123	20	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Plate....	4	Unit E..	C....	Sp. Bevel..	820x120	Steel....	Cant....	Tr.-R.....
Fiat	104	49	4	L...	C'Case..	Det.	65x110	2.56x4.33	1.7	89	10	Pump...	Press...	Own.....	Grav..	Mag.....	Own 2-Unit..	Disk....	4	Unit E..	R....	Sp. Bevel..	760x90	Steel....	½-El...	R.....
Fiat	120	55	4	L...	C'Case..	Det.	75x130	2.95x5.12	1.73	140	15	Pump...	Press...	Own.....	Press..	Mag.....	Own 2-Unit..	Disk....	4	Unit E..	R....	Sp. Bevel..	820x120	Steel....	½-El...	R.....
Fiat	134	55	6	L...	C'Case..	Det.	75x130	2.95x5.12	1.73	210	20	Pump...	Press...	Own.....	Press..	Mag.....	Own 2-Unit..	Disk....	4	Unit E..	R....	Sp. Bevel..	895x135	Steel....	½-El...	R.....
Fiat	152	59	12	I...	C'Case..	Det.	85x110	3.35x4.33	1.29	457	80	Pump...	Press...	Own.....	Press..	Bat.....	Own 1-Unit..	Disk....	3	Unit E..	R....	Sp. Bevel..	895x135	Steel....	Cant....	Fr.-R.....
Isotta-Fraschini	146	55	8	I...	C'Case..	Det.	85x130	3.35x5.12	1.5	360	80	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	3	Unit E..	R....	Sp. Bevel..	895x135	Wire....	½-El...	Fr.-R.....
Itala	126	55	4	L...	C'Case..	Fix.	83x130	3.27x5.12	1.5	172	25	Pump...	Press...	Own.....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Sp. Bevel..	820x120	Steel....	½-El...	Tr.-R.....
Itala	142	55	6	Sl..	C'Case..	Fix.	85x130	3.35x5.12	1.5	270	60	Pump...	Press...	Zenith....	Vac...	Bat.....	2-Unit.....	Disk....	3	Unit E..	R....	Sp. Bevel..	895x135	Wire....	½-El...	Fr.-R.....
Lancia	133	52	4	L...	C'Case..	Det.	110x130	4.3x5.1	1.18	302	30	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Sp. Bevel..	895x135	Disk....	½-El...	Tr.-R.....
Lancia	133	52	4	I...	C'Case..	Det.	110x130	4.3x5.1	1.18	302	35	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Sp. Bevel..	895x135	Disk....	½-El...	Tr.-R.....
Lancia	133	52	8	I...	C'Case..	Det.	75x130	2.95x5.1	1.7	280	40	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Amid...	R....	Sp. Bevel..	895x135	Wire....	½-El...	Tr.-R.....
Nazzaro	124	55	4	I...	Head...	Det.	90x140	3.5x5.5	1.55	217	30	Pump...	Press...	Zenith....	Grav..	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Bevel.....	820x135	Steel....	½-El...	R.....
Scat	114	52	4	L...	C'Case..	Fix.	75x120	2.95x4.7	1.6	129	12	Pump...	Press...	Zenith....	Vac...	Mag.....	2-Unit.....	Disk....	4	Unit E..	R....	Sp. Bevel..	760x105	Steel....	½-El...	Tr.-R.....
Spa	126	55	4	L...	C'Case..	Det.	85x120	3.3x4.7	1.41	166	20	Pump...	Press...	Zenith....	Grav..	Mag.....	2-Unit.....	Plate....	4	Unit E..	R....	Sp. Bevel..	820x120	Steel....	½-El...	Tr.-R.....
Spa	146	57	4	I...	Head...	Det.	85x130	3.3x5.1	1.53	180	40	Pump...	Press...	Zenith....	Grav..	Mag. & Bat	2-Unit.....	Plate....	4	Unit E..	R....	Sp. Bevel..	895x135	Steel....	Cant....	Fr.-Tr.-R..

For abbreviations see page 345

The Trend in French Passenger Car Design

Four cylinder models predominate. Vacuum fuel feed used on all except small cars. Four speed transmissions on 73 per cent of models. Four wheel brakes on one-fourth of cars. Specifications show design details

By W. F. Bradley

THE French passenger car specifications show 69 makers producing 135 models, this comprising the entire French industry with the exception of cycle car manufacturers of comparatively small importance. One model only is produced by 30 makers; two models are built by 24 firms; 8 firms have three models, and 7 have four or more different types. This enumeration only covers French passenger cars.

The battle of the cylinders has been won by the "four." Out of 135 models comprised in the list 106, or 78.5 per cent, have an engine with four cylinders. It should be noted, too, that these comprise all the big production jobs, there being only one maker in France who attempts to supply a medium priced car with more than four cylinders. The six-cylinder engine comes next on the list, with 13.33 per cent, practically all these being high grade jobs produced in limited quantities. There has been a revival in the eight-cylinder engine of the line-ahead type, these now representing by 5.18 per cent. It should be noted that there has been no increase in the number of eight-cylinder V engine, the only makers being De Dion Bouton, with two models, and Talbot-Darracq with one model. Both these firms also produce four-cylinder cars. There is only one twelve-cylinder car on the list, this being the high grade Voisin. The single-cylinder has also a single representative if cycle cars are ignored, and there are only two cases of twin-cylinder engines. It is worth noting that even for very small cars there is a tendency to use a small four-cylinder in preference to a twin.

The L-head engine is at the top of the list with 68.1 per cent, followed by the I-head with 24.44 per cent; of these latter 63.6 per cent have the camshaft in the base chamber, the valves being operated by concealed push rods in the cylinder block, and 36.4 per cent have an overhead camshaft.

Poppet Valves Dominate

Sleeve valve engines are represented by 7.4 per cent. These comprise the Knight engine and other types of sleeves. The poppet valve engine dominates the field.

Water circulation by means of a pump is found on 59.25 per cent of French cars, with thermo-siphon cooling on 40 per cent. Only one car is air cooled.

Few automobile makers now fit their own carbureter. Vacuum fuel feed holds the field, the gravity type being found only on small cars which can carry the tank on the dash. Pressure tanks are very little used.

An important fight is in progress between magneto and battery ignition. The former has been designated on the list as Delco, for in every case where the magneto has been abandoned this move has been made in favor of Delco apparatus. Under this count there is a percentage of 85.2 engines with magneto ignition and 14.8 per cent with Delco ignition.

Unit construction of engine and gear box has made remarkable progress, if it is remembered that in 1914 it was very rarely employed and is now to be found on 55.5 per cent of French cars. The midship position of the gearbox, which constitutes a separate unit from the engine, is represented by 42.2 per cent. There are only three cars with the change speed mechanism in the rear axle, the proportion being 2.2 per cent.

Transmission Trends

Four-speed transmissions retain the enormous majority of 73.3 per cent, compared with 25.9 per cent for three-speed transmissions. There is only one car, representing 0.8 per cent, with a two-speed transmission.

Spiral bevel drive has almost driven out all other systems, for it is represented by 60 per cent, compared with 32.5 per cent for straight bevel. Worm driven rear axles are only 2.2 per cent; internal gear drive is represented by 2.9 per cent, these being four cars from the same maker. Other types of gear are the "chevron" or herringbone, used by Cirtoen and Mors. The spiral bevel would have a still greater following were it not that several of the smaller makers do not possess the plant necessary for cutting these gears.

The old-established system of a brake on the transmission and a pair on the rear wheels still heads the list with 51.1 per cent of the whole. In practically all these cases the transmission brake is foot operated and the rear wheel brakes are applied by hand. The great change, however, is the adoption of brakes on both front and rear wheels for 24.4 per cent of French models. Some of these cars also have a hand operated transmission brake, but this is merely to comply with the law calling for two independent braking systems. Others meet this requirement by a foot control for the four brakes and an independent lever control for the rear wheel brakes only. Brakes on the rear wheels only, the great majority of these being side by side, are also 24.4 per cent of the whole. This braking system has grown in popularity since the adoption of unit construction of engine and gearbox.

Although gaining ground, the detachable head is still in a minority compared with the fixed head, the percentages being 68.8 for the fixed and 31.2 for the detachable. Delahaye, who took up the detachable head with valve caps two years ago has abandoned it in favor of a fixed head, and one of the Talbot-Darracq models has been changed from detachable to fixed head. On the other hand a new type brought out by this firm has detachable head.

The figures covering wheels should be examined with a certain amount of circumspection, for while the big makers standardize, many of the smaller firms have no settled policy and will furnish the type of wheel requested by the client.

Trend in Truck Design as Revealed by Specifications for 1922 Models

Out of 494 models listed, 138 are of 1 to 1½ tons capacity, 145 are 2 to 2½ tonners and 95 are 3 to 3½ tonners. Wide use of more or less standardized components is reflected in great uniformity of specifications. Tendency to four-speed gearset. Worm drive still most popular type.

TRUCKS of 1½ tons capacity are still the most popular size, but the number of 2½-ton models listed this year is nearly as great, the figures being 82 and 81 respectively. Twenty-eight per cent of the 494 models listed are of 1 to 1½ tons capacity, 29 per cent 2 to 2½ tons, and 19 per cent 3 to 3½ tons. The remaining 24 per cent are divided as follows: 4 and 5 ton, 16 per cent; 6 to 15 ton, 4 per cent; ½ and ¾ ton, 4 per cent.

There are few pronounced changes to be noted in connection with the detailed specifications. This would seem to indicate that truck design is becoming more and more nearly standardized. It is, of course, a well known fact that a very large percentage of makes of American built trucks are assembled from more or less standard parts which can be made in sufficiently large quantities to make it possible for the parts maker to sell them as a rule for a lower price than that at which individual truck manufacturers can make them. Since the standardized units themselves are quite similar in many cases, it is obvious that when a comparison is made on a basis of the total number of models listed the satus of the parts market will be reflected. If a comparison could readily be made on a basis of the number of trucks in use employing a given type of construction produced, some quite different comparisons would be obtained. For example, the Autocar Co. and the International Motor Co., who build the Mack truck, use types of final drive which have proved highly successful but which are not very generally marketed if made at all by parts makers, and are therefore seldom seen in trucks assembled from standard component parts. The companies mentioned, however, are among the largest producers of trucks, so that a comparison which takes volume production into consideration would be quite different from the comparison here given.

The percentage figures which follow have been computed by dividing by the number of models on which questionnaire returns were received, the number which reported the use of a certain type of construction. For example, of the 494 truck models listed, 401 reported the use of a pump for water circulation, 77 reported the use of thermo-siphon circulation, and 16 failed to give data under this heading, leaving 478 on which returns were complete, so far as this item is concerned. Of this number, the 401 which employ pump circulation are 83.9 per cent of the total reporting under this heading, while 77 compose the remaining 16.1 per cent of the total reported.

The statistics here given indicate relatively little change in engine design; 76.5 per cent employ block cast cylinders, this proportion being exactly the same as last year. There is a slight gain in the number using pair-cast cylinders, while the separately cast cylinder has disappeared entirely on all engines except the two-cylinder Autocar, which is the only American truck listed which does not use a four-cylinder engine.

In respect to clutch design the trend away from the cone and toward the disk type continues. Only 2 per cent of the models listed use cone clutches, while 98 per cent use either the multiple disk or single plate type. Of the 483 in which specific information regarding the clutch is given, 376 use the dry multiple disk type, 8 the multiple disk in oil, 89 the single plate type and 10 the cone clutch.

The number of models using gravity fuel feed are still in the majority, but the advocates of this system continue to lose ground, while the use of vacuum feed is increasing. There are still a few makers who employ pressure feed, but the percentage is slightly less than last year.

For several years there has been but slight change in the percentage of cooling systems using pump and thermo-siphon circulation, and there is less change this year than last. About one-sixth of the models listed have thermo-siphon systems, and the bulk of these are in the light higher speed class of chassis.

The trend toward the use of gearsets with a greater number of speed changes continues. Over 62 per cent of models have four speeds, as against 57.4 per cent last year. The percentage using three-speed gearsets has reduced from 40 to 34.3. 12 trucks have 5 or more speeds.

There is a slight increase in the proportion of trucks using unit powerplants, due, no doubt, to the fewer number of parts and consequent simplicity. This construction is sometimes used at the expense of accessibility, an argument which accounts in part for the continued use of amidship gearset mounting on nearly half the models.

In respect to the type of final drive the figures show a further increase in the percentage of models using the worm, but it is worthy of note that at least three of the oldest and largest truck manufacturers who make their own rear axles prefer other types of final drive. The gain in the percentage of models using the worm type of final drive appears to have been made at the expense of all other types except the bevel gear, which is quite generally used on the lightest trucks. The percentage of models using this type of gear is still small but is slightly larger than last year.

Metal wheels are still gaining slightly in popularity, although the rate of increase is much less than in other years, but nearly 63 per cent of all models are still equipped with wood wheels. Of the metal wheels about 90 per cent are cast steel.

For three years past over 70 per cent of models have been equipped with pressed steel frames, the percentage increasing slightly each year. This year 69.5 per cent of models have pressed steel frames as against 73.6 per cent last year. The percentage using rolled section frames has shown a corresponding increase from 26.4 to 30.3.

*See charts of page 362 for graphical presentation of design trends.

Specifications of

Make and Model	Tons Capacity	Wheel-Base, Ins.	TIRE SIZE		ENGINE																ELECTRICAL SYSTEM		
												OILING SYSTEM		FUEL SYSTEM			GOVERNOR		SPEED				
			Front, Ins.	Rear, Ins.	Make	Number Cylinders, Bore and Stroke	Cylinders, Cast	Camshaft Drive Type	Radiator Core Make	Radiator Core Type	Water Circulation	Type	Oil Pump Type	Carbureter Make	Carbureter Size, Ins.	Fuel Feed	Make	Type	Motor in R.P.M.	Truck in M.P.H.	Generator Make	Ignition System, Make	Ignition System, Type
Acason.....H	2½	150	36x4	36x4d	Wau....	4-4½x5½	2	.....	Natl...	Cel...	Pump.	.....	.....	Schebl...	....	Vac...	Wau....	Cent...	1200	18	.....	Eis....	S-P...
Acason.....L	3½	180	36x5	36x5d	Wau....	4-4½x5½	2	.....	Natl...	Cel...	Pump.	.....	.....	Sch b ..	....	Vac...	Wau....	Cent...	1200	14	.....	Eis....	S-P...
Ace.....C	1½	144	34x3½	34x5d	Buda...	4-3½x5½	4	Met-Gear..	Mod....	Cel...	Ther..	Cir-Spl..	Gear..	Zenith...	1	Vac...	.....	.....	1250	18	West...	At-K...	O-C...
Ace.....A	2½	156	36x4	36x4d	Buda...	4-4½x5½	4	Met-Gear..	.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Vac...	.....	.....	1250	16	West...	Eis....	.....
Acme.....G	½	130	35x5*	35x5*	Cont....	4-3½x5	4	Met-Gear..	G&O....	Cel...	Ther..	.....	Gear..	Rayfld..	1	Vac...	.....	.....	1700	28	Eis....	Eis....	S&C..
Acme.....B	1	130	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear..	G&O....	Cel...	Ther..	Cir-Spl..	.....	Rayfld..	1	Vac...	Dup....	Cent..	1700	23	Eis....	Eis....	S&C..
Acme.....F	1½	141	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Zenith...	1	Vac...	Dup....	Cent..	1600	18½	Dayt...	Eis....	S&C..
Acme.....A	2	148	36x4	36x7	Cont....	4-4½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Rayfld..	1½	Vac...	Dup....	Cent..	1500	17½	Dayt...	Eis....	S&C..
Acme.....AC	2½	156	36x4	36x7	Cont....	4-4½x5½	4	Met-Gear..	Bre....	Fin...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac...	Dup....	Cent..	1300	30	Dayt...	Eis....	S&C..
Acme.....C	3½	168	36x5	40x5d	Cont....	4-4½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac...	Dup....	Cent..	1300	13½	Dayt...	Eis....	S&C..
Acme.....E	5	180	36x6	40x6d	Cont....	4-4½x6	2	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Rayfld..	1½	Vac...	Cont....	Cent..	1250	12½	Dayt...	Eis....	S&C..
Akron Multi-Truck...20	1½	133½	34x5*	34x5*	Hink....	4-4 5½	4	Met-Gear..	Fed....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra....	.....	.....	1800	35	West...	West...	S&O..
American.....25	2½	158	36x4	36x4d	Wis.....	4-4x6	4	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Own....	Cent..	1600	18	West...	Apollo..	S-P...
American.....40	4	158	36x5	36x5d	Wis.....	4-4½x6	4	Met-Gear..	G&O....	F n...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Own....	Cent..	1600	15	West...	Apollo..	S-P...
American.....50	5	174	36x5	36x5d	Wis.....	4-4½x6	4	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Own....	Cent..	1600	15	West...	Apollo..	S-P...
Armleder.....20	1	148	34x3½	34x5*	Buda...	4-3½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1	Vac...	.....	.....	1400	....	West...	Bosch..	S&C..
Armleder.....HW	2½	148	36x4*	36x7*	BorC....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Gra...	Pharo...	Hyd..	1350	....	Vesta..	Bosch..	S&C..
Armleder.....KW	3½	156	36x5*	36x5d*	BorC....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Gra...	Pharo...	Hyd..	1250	12	Vesta..	Bosch..	S&C..
Atco.....B	1½	132	34x5*	36x6*	Buda...	4-3½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Vac...	.....	.....	.....	....	West...	Eis....	.....
Atco.....A	2½	150	36x4*	36x8*	Buda...	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	....	18	Eis....	Eis....	.....
Atlas.....MD	1	130	32x4½p	32x4½p	Lyc.....	4-3½x5	4	.....	.....	Fin...	.....	.....	.....	Marvel...	....	Gra...	.....	.....	.....	....	Bijur..	At-K...	.....
Atterbury.....20R	1½	144	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1	Vac...	Simp....	Cent..	1525	20	Delco..	Berlg...	.....
Atterbury.....7CX	2½	153½	36x5	36x4d	Cont....	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist..	Zenith...	1½	Gra...	Mon....	Suc..	1300	15	.....	Eis....	.....
Atterbury.....7DX	3½	167½	36x5	40x5d	Cont....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist..	Zenith...	1½	Gra...	Mon....	Suc..	1200	14	.....	Eis....	.....
Atterbury.....8E	5	167½	36x5	40x6	Cont....	4-4½x6	2	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Vac...	Cont....	Cent..	1100	11	Delco..	Eis....	.....
Autocar.....21F	1½	97	34x4	34x6	Own.....	2-4½x4½	1	Met-Gear..	Own....	Fin...	Pump.	Cir-Spl..	Pist..	Stromb.	1½	Gra....	.....	.....	.....	....	.....	.....	.....
Autocar.....27H	2	114	34x5	34x7	Own.....	4-4x5½	4	Com-Gear.	.....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	Gra...	Pharo...	Oil..	.....	....	.....	.....	.....
Autocar.....26B	5	156	34x6	36x12	Own.....	4-4½x5½	4	Com-Gear.	.....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1¼	Gra...	Pharo...	Oil..	.....	....	.....	.....	.....
Available.....H1½	1½	147	36x3½	36x5	Her.....	4-4x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Gra...	McCan..	Suc..	1176	18	Bosch..	Bosch..	S&O..
Available.....H2½	2½	152	36x4	36x8	Her.....	4-4x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Vac...	Pier....	Cent..	1270	16	Bosch..	Bosch..	O-C...
Available.....H3½	3½	176	36x5	40x5d	Her.....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1215	14	Bosch..	Bosch..	O-C...
Available.....H5	5	190	36x6	40x12	Her.....	4-5x6	2	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1180	12	Bosch..	Bosch..	O-C...
Avery.....	1	129	34x5p	34x5p	Own.....	4-3x4	..	.....	.....	Cel...	Ther..	.....	.....	Stromb..	....	Vac...	Own....	.....	....	20	West...	KW....	.....
Belmont.....D	2	144	34x3½*	34x6*	Buda...	4-4½x5½	4	.....	Rome-T	Fin...	Pump.	.....	Gear..	Zenith...	1½	Gra...	Pier....	Cent..	1600	....	Dynet...	.....	.....
Bessemer.....G	1	124	34x3*	34x4*	Cont....	4-3½x5	4	Met-Gear..	Stan....	Cel...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Gra...	.....	.....	.....	....	Bijur..	Bosch..	S-P...
Bessemer.....H2	1½	144	36x3½	36x5	Cont....	4-3½x5	4	Met-Gear..	Stan....	Cel...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Gra...	.....	.....	.....	....	Bijur..	Bosch..	S-P...
Bessemer.....J2	2½	158	36x4	36x4d	Cont....	4-4½x5½	4	Met-Gear..	Stan....	Cel...	Pump.	Cir-Spl..	Pist..	Stromb..	1½	Gra...	Pier....	Cent..	.....	....	Eis....	Eis....	S-P...
Bessemer.....K2	4	175	36x5	36x5d	Cont....	4-4½x5½	2	Met-Gear..	.....	Cel...	Pump.	Cir-Spl..	Pist..	Stromb..	1½	Gra...	Pier....	Cent..	.....	....	.....	.....	S-P...
Big Four.....K	4	124	36x7	36x10	Buda...	4-4½x6	4	Met-Gear..	.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith...	....	Vac...	.....	Cent..	.....	....	.....	.....	.....
Brinton.....F2½	2½	156	36x4	36x7	Cont....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	.....	Stromb..	1½	Gra...	Pier	Cent..	.....	....	.....	.....	C-C...
Brockway.....E	1	135	35x5p	35x5p	Buda...	4-3½x5½	4	Met-Gear..	Long....	Fin...	Ther..	Cir-Spl..	.....	Stromb..	1	Vac...	.....	.....	.....	....	Remy..	Remy..	O-C...
Brockway.....SK	1½	145	36x4	36x6	Cont....	4-4½x5½	4	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pharo...	Hyd..	1300	22	NE....	Eis....	O-C...
Brockway.....K5	2½	153	36x4	36x8	Cont....	4-4½x5½	4	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pharo...	Hyd..	1300	18	NE....	Eis....	O-C...
Brockway.....R4	3½	164	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pharo...	Hyd..	1200	14½	NE	Eis....	O-C...
Brockway.....T4	5	174	36x6	40x6d	Cont....	4-4½x6½	2	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Cont....	Cent..	1100	13	NE....	Eis....	O-C...
Bridgeport.....A	1½	146	34x3½	34x6	Buda...	4-3½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	.....	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1250	25	G&D....	.....	.....
Bridgeport.....B	2½	156	36x4	36x4d	Buda...	4-4½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	.....	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1200	15	Opt....	Eis....	.....
Bridgeport.....C	3½	170	36x5	36x10	Buda...	4-4½x6	4	Met-Gear..	G&O....	Fin...	Pump.	.....	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1250	13	Opt....	Opt....	.....
Case.....JI	2	144	36x6p	38x7p	Own.....	4-4½x5½	4	.....	Mod....	Cel...	Cent..	Cir-Spl..	.....	Bennet...	....	Gra...	Own....	Hyd..	1400	20	Eis....	Eis....	.....
Chevrolet.....G	½	120	31x4p	34x4½p	Own.....	4-3½x4	4	.....	Har.....	Cel...	Pump.	Cir-Spl..	Gear..	Zenith...	1	Gra...	.....	.....	.....	....	Aut-L..	Remy..	C-C...
Chicago.....C1½	1½	144	36x3½	36x5	Her.....	4-3½x5½	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Gra...	.....	.....	1300	18	.....	Bosch..	.....
Chicago.....C2½	2½	156	36x4	36x7	Her.....	4-4x5½	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Simp....	Cent..	1350	16	.....	Bosch..	.....
Chicago.....C3½	3½	156	36x5	36x10	Her.....	4-4½x5½	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Simp....	Cent..	1250	12½	.....	Bosch..	.....
Chicago.....D5	5	156	36x6	40x12	Her.....	4-4½x5½	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Simp....	Cent..	1250	10	.....	Bosch..	.....
Climber.....A	1½	146	36x6*	38x7*	H-S.....	4-3½x5	4	.....	Chic....	Fin...	Ther..	.....	.....	Stromb..	....	.....	.....	.....	1500	20	West...	At-K...	.....
Clydesdale.....18	½	136	34x5	34x5p	Cont....	4-3½x5	4	Met-Gear..	Own....	PT...	Ther..	Cir-Spl..	Pist..	Zenith...	1	Vac...	Own....	Cent..	1600	33	Eis....	Eis....	.....
Clydesdale.....20	1	136	34x5p	34x5p*	Cont....	4-3½x5	4	Met-Gear..	Own....	PT...	Ther..	Cir-Spl..	Pist..	Zenith...	1	Vac...	Own....	Cent..	1570	40	Eis....	Eis....	.....
Clydesdale.....42	1½	146	36x3½*	36x6*	Cont....	4-3½x5	4	Met-Gear..	Own....	PT...	Ther..	Cir-Spl..	Pist..	Zenith...	1	Gra...	Own....	Cent..	1200	18	Eis....	Bosch..	.....
Clydesdale.....65X	2½	163	36x4	36x4d*	Cont....	4-4½x5½	4	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Pist..	Zenith...	1½	Gra...	Own....	Cent..	1370	17	Eis....	Bosch..	.....
Clydesdale.....90	3½	170	36x5	40x5d	Cont....	4-4½x5½	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Pist..	Zenith...	1½	Gra...	Own....	Cent..	1400	16	Eis....	Bosch..	S&O..
Clydesdale.....120B	5	176	36x6	40x6d	Cont....	4-4½x6	2	Met-Gear..	Own....	PT...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Own....	Cent..	1400	14	West...	Bosch..	S&O..

TRUCK ABBREVIATIONS

Tires:
C—Cushion
D—Dual
P—Pneumatic
*—Other Options

Engine Make:
B or C—Buda or Continental
Cont—Continental Motors Corp.
D-Lyc—Dort-Lycoming Motor Corp.
Dodge—Dodge Bros.
Gray B—Gray Beall Motor Corp.
H-S—Herschell-Spillman Motor Co.
Her—Hercules Motor Mfg. Co.
High—Highway Engine Co.
Hink—Hinkley Motors Corp.
Lyc—Lycoming Motors Corp.
Mid—Midwest Engine Co.
Wau—Waukesha Motor Co.
Wei—Weidely Motors Co.
Wis—Wisconsin Motor Mfg. Co.

Camshaft Drive:
Com-Gear—Combination Gear
Met-Gear—Metal Gear
N-M-G—Non-Metallic Gear

Radiator Core Make:
AM C—American Can Co.
B&W—B&W Mfg. Co.
Bre—Bremer Mfg. Co.
Chic—Chicago Mfg. Co.
E & M—English & Mersick Co.
Fed—Fedders Mfg. Co.
Flex—Flexo Mfg. Co.
G&O—G&O Mfg. Co.
Gor—Gordon Radiator Co.
Har—Harrison Radiator Corp.
Hoo—Hoover
Liv—Livingston Radiator Corp.
M P Co.—Motor Products Co.
McCo—McCord Mfg. Co.
Mod—Modine Mfg. Co.
Natl—National Can Co.
Perf—Perfex Radiator Co.
Rome-T—Rome-Turney Radiator Co.
Stan—Standard
W R Co.—Wheeler Radiator & Mfg. Co.

Radiator Core Type:
Cel—Cellular
Fin—Finned Tube
P T—Plain Tube

Water Circulation:
Ther—Thermo-Siphon

Oiling System Type:
Cir-Spl—Circulating Splash (includes systems with pressure to main bearings, but not to connecting rod bearings)
Hol-Crk—Hollow Crankshaft

Oil Pump Type:
Ecc—Eccentric
Pist—Piston

Carbureter Make:
Johns—Johnson Co.
King—(Kingston)—Bryne, Kingston Co.
Rayfld—(Rayfield)—Beneke & Kropf Mfg. Co.
Schebl—Wheeler-Schebler Carburetor Co.
Stromb—Stromberg Motor Devices Co.
Tillot—Tillotson Mfg. Co.

Fuel Feed:
Gra—Gravity
Pr—Pressure
Vac—Vacuum

Governor Make:
Cont—Continental
Dup—Duplex Engine Governor Co.
Hink—Hinkley
McCan—McCanna
Mon—Monarch Governor Co.
Muel—Mueller
Opt—Optional
Pier—Pierce Governor Co.
Simp—(Simplex)—Duplex Engine Governor Co.
Wau—Waukesha Motor Co.

Governor Type:
Cent—Centrifugal
Hyd—Hydraulic
O-O—Oil Operated
Suc—Suction

Generator and Ignition Make:
Aut-L—Electric Auto-Lite Corp.
Eis—Eisemann
Dayt—Dayton
Dyn—Dyneto
G & D—Gray & Davis
Lee-N—Leece-Neville Co.
N E—North East Electric Co.
Opt—Optional
West—Westinghouse Electric & Mfg. Co.

Ignition Make:
At-K—Atwater-Kent Mfg. Co.
Bend—Bendix
Berlg—Berling
Conn—Connecticut Telephone & Electric Co.
K W—K W Ignition Co.
Splitd—Splitdorf

Ignition Type:
C-C—Closed Circuit
C-D—Closed Circuit Double Point
D-P—Double Point
O-C—Open Circuit
S & C—Single Point and Closed Circuit
S & O—Single Point and Open Circuit
S-P—Single Point

Clutch Make:
B & B—Borg & Beck Co.
B-L—Brown-Lipe
Cov—Covert Gear Co.
Det—Detlaff Co.
Dt—Detroit Gear and Machinery Co.
Dodge—Dodge Bros.
Ful—Fuller & Sons Mfg. Co.
Hele—Hele-Shaw (Merchant & Evans Co.
Mech—Mechanics Machine Co.
M & E—Merchant & Evans Co.
Twin—Twin Disc Clutch Co.
Uni—Universal

American Trucks

CLUTCH		TRANSMISSION												SPRINGS		BRAKES		STEERING		WHEELS			
		GEARSET				UNIVERSAL JOINTS		AXLES															
Make	Type	Make	Type	Location	Forward Speeds	Make	Type	Front Make	Rear Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Final Drive Type	Front	Rear	Service	Emergency	Steering Gear Make	Steering Gear Type	Make	Type	Frame Material	Make and Model
Det	D-M	Cotta	Ind	Sep-Un	4	Blood	Met		Tim	7.75	Sp	Sp	Worm					Ross		Smith		P-S	Acason H
Det	D-M	Cotta	Ind	Sep-Un	4	Blood	Met		Tim	8.75	Sp	Sp	Worm					Ross		Smith		P-S	Acason L
Ful	D-M	Ful	SG	Sep-Un	3	Spi	Met	Tim	Tim	7.00	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Sch	Art	P-S	Ace C
Ful	D-M	Ful	SG	Sep-Un	4	Spi	Met	Tim	Tim	7.75	Sp	Sp	Worm	E	E	IntR-W		Ross	S&N	Sch	Art	P-S	Ace A
B&B	Pla	Cotta	CM	Un-WE	3	Blood	Met	Tim	Tim	6.25	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	Bimel		P-S	Acme G
B&B	Pla	Cotta	CM	Un-WE	3	Blood	Met	Tim	Tim	7.20	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	Bimel	Art	P-S	Acme B
B&B	Pla	Cotta	CM	Un-WE	3	Blood	Met	Tim	Tim	8.75	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	Bimel	Art	P-S	Acme F
B&B	Pla	Cotta	CM	UN-WE	4	Blood	Met	Tim	Tim	9.25	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	Bimel	Art	P-S	Acme A
B&B	Pla	Cotta	CM	Un-WE	4	Blood	Met	Tim	Tim	6.00	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	Bimel	Art	P-S	Acme AC
B&B	Pla	Cotta	CM	Sep-Un	4	Blood	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	Int	Int	Ross	S&N	Bimel	Art	P-S	Acme C
B&B	Pla	Cotta	CM	Sep-Un	4	Blood	Met	Tim	Tim	11.66	RR	Sp	Worm	E	E	Int	Int	Ross	S&N	Smith	C-S	P-S	Acme E
War	D-M	War	SG	Un-WE	3		Fab	Eat	Eat	5.12	Sp	Sp	S-B	E	E	Int	Int	Jac	S&N	Bimel	Art	P-S	Akron Multi-Truck 20
Det	D-M	Cotta	CM	Un-WE	4	Arvac	Met	Sav	Tho	8.66	Sp	Sp	Worm	E	E			Ross		Indes	P-S	P-S	American 25
Det	D-M	Cotta	CM	Sep-Un	4	Arvac	Met	Sav	Wis	10.00	Sp	Sp	Worm	E	E	Int	Int	Lav	W&S	Indes	P-S	P-S	American 40
Det	D-M	Cotta	CM	Sep-Un	4	Arvac	Met	Sav	Tho	10.00	Sp	Sp	Worm	E	E	Int	Int	Ross	W&S	Indes	P-S	P-S	American 50
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	Shu	Tim	7.25	RR	Sp	Worm	E	E	IntR-W	IntRW	Ross	S&N	StM	Art	P-S	Armleder 20
Ful	D-M	Ful	SG	Un-WE	4	Spi	Met	Tim	Tim	9.25	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	StM		P-S	Armleder HW
Ful	D-M	Ful	SG	Un-WE	4	Spi	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	SM		R-S	Armleder KW
Ful	D-M	Ful	SG	Un-WE	3	Hart	Met		Wis	7.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	Iron	R-S	Atco B
Ful	D-M	Ful	SG	Sep-Un	4	Hart	Met	She	Wis	8.67	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	Iron	P-S	Atco A
B&B	Pla	Own			3				Own				Worm	E	E	ExtR-W	Dr	CAS		E&O	Art	P-S	Atlas MD
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	Tim	Tim	7.75	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	Arch	Art	P-S	Atterbury 20R
B-L	D-M	B&L	SG	Un-WE	4	Spi	Met	Tim	Tim	9.25	Sp	Sp	Worm	E	E	Int	Int	Gem	W&S	Arch	Art	P-S	Atterbury 7CX
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	10.33	Sp	Sp	Worm	E	E	Int	Int	Gem	W&S	Arch	Art	P-S	Atterbury 7DX
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	11.60	RR	Sp	Worm	E	E	Int	Int	Gem	W&S	Stan	C-S	P-S	Atterbury 8E
Own	Pla	Own	SG	Sep-Un	3	Spi	Met	Own	Own	8.30	Sp	Sp	B-S	E	Pl	ExtR-W	IntR-W	Ross	S&N		Art	P-S	Autocar 21F
Own	Pla	Own	SG	Sep-Un	4		Met	Own	Own	6.43	Sp	Sp	B-S	E	E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Autocar 27H
Own	Pla	Own	SG	Sep-Un	4	Spi	Met	Own	Own	8.70	Sp	Sp	B-S	E	E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Autocar 26B
B-L	D-M	B-L	SG	Un-WE	3	M&E	Met	Tim	Tim	7.00	RR	Sp	Worm	E	E	Int	Int	Ross	S&N	StM	Art	R-S	Available H1½
B-L	D-M	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	8.50	RR	Sp	Worm	E	E	Int	Int	Ross	S&N	StM	Art	R-S	Available H2½
B-L	D-M	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	Int	Int	Ross	S&N	StM	Art	R-S	Available H3½
B-L	D-M	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	11.66	RR	Sp	Worm	E	E	Int	Int	Ross	S&N	Smith	C-S	R-S	Available H5
Own	D-D												Int					Ross		Own	Art	P-S	Avery
Ful	D-M	Ful	SG	Un-WE		Uni	Met	Shu	Rus		Sp	Sp	Int	E	El	Ext		Lav	S&N	Own	Art	P-S	Belmont D
Ful	D-M	Ful	SG	Un-WE	3	Arvac	Met	Shu	Tor	7.00	Sp	Sp	Int	E	E	ExtR-W	IntR-W	Ross	S&N	Sch	Art	P-S	Bessemer G
B&B	Pla	B-L	SG	Sep-Un	3	Arvac	Met	Shu	Tor	8.00	RR	Sp	Int	E	E	ExtR-W	IntR-W	Ross	S&N	Sch	Art	P-S	Bessemer H2
B&B	Pla	B-L	SG	Sep-Un	4	Arvac	Met	Shu	Tor	8.00	RR	Sp	Int	E	E	ExtR-W	IntR-W	Ross	S&N	Sch	Art	P-S	Bessemer J2
B&B	Pla	B-L	SG	Sep-Un	4	Spi	Met	Shu	Tor	10.25	RR	Sp	Int	E	E	ExtR-W	Dr	Ross	S&N	Smith	C-S	P-S	Bessemer K2
B-L	D-M	Own	SG	Sep-Un	6	Spi	Met	Own	Own	7.50	Sp	Sp	Worm	E	E	Ext	Int	Ross	S&N	Smith	C-S	R-S	Big Four K
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	Tim	Tim		RR	Sp	Worm	E	E	I&ER-W	I&ER-W	Ross	W&W	Smith	C-S	R-S	Brinton F2½
War	D-M	War	SG	Un-WE	3	Spi	Met	Col	Col	5.85	Sp	Sp	S-B	E	E	Ext	Int	Lav	S&N		Art	P-S	Brockway E
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	Tim	Tim	6.50	RR	Sp	Worm	E	E	Int	Int	Gem	W&W		Art	P-S	Brockway SK
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	7.75	RR	Sp	Worm	E	E	Int	Int	Gem	W&W		Art	P-S	Brockway K5
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	8.75	RR	Sp	Worm	E	E	Int	Int	Gem	W&W	Smith	C-S	P-S	Brockway R4
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.25	RR	Sp	Worm	E	E	Int	Int	Gem	W&W	Smith	C-S	P-S	Brockway T4
	Pla	B-L	SG	Un-WE	3	Hart	Met	Shu	Wis	7.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&W	Jones	Art	R-S	Bridgeport A
B&B	Pla	B-L	SG	Un-WE	4	Hart	Met	Shu	Eat	7.25	Sp	Sp	Worm	E	E	Int	Int	Ross	W&W	Jones	Art	R-S	Bridgeport B
B&B	Pla	B-L	SG	Sep-Un	4	Hart	Met	Shu	Eat	10.25	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&W		Art	R-S	Bridgeport C
Twin	Pla	Own	SG	Un-WE	3	Spi	Met	Tor	Tor		Sp	Sp	I-G	E	E			Ross					Case J1
Own	Cone	Own	SG	Un-WE	3	Own	Met	Own	Cen	5.50	Sp	TT	S-B	E	E	ExtR-W	IntR-W	Own	Plan	Hayes	Art	P-S	Chevrolet G
B-L	D-M	B-L	SG	Un-WE		Pet	Met	Tim	Tim	7.00	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Opt		R-S	Chicago C1½
B-L	D-M	B-L	SG	Un-WE	4	Pet	Met	Tim	Tim	8.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Opt		R-S	Chicago C2½
B-L	D-M	B-L	SG	Sep-Un	4	Pet	Met	Tim	Tim	10.33	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Gem		Opt		R-S	Chicago C3½
B-L	D-M	B-L	SG	Sep-Un	4	Pet	Met	Tim	Tim	13.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Opt		R-S	Chicago D5
		Mun	SG	Un-WE	3	Hart	Met	Tor	Tor		Sp	Sp	I-G	E	E			Ross		Roy	Art	P-S	Climer A
B-L	D-M	B-L	SG	Un-WE		Spi	Met	Tim	Tim	5.00	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	Art	P-S	Clydesdale 18
B-L	D-M	B-L	SG	Un-WE		Spi	Met			6.20	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Clydesdale 20
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	Tim	Tim	7.00	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Clydesdale 42
B-L	D-M	B-L	SG	Sep-Un	4	Spi		Tim	Tim	8.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Clydesdale 65X
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Clydesdale 90
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	11.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Clydesdale 120B

War—Warner Gear Co.

Clutch Type:
Con—Cone
D-O—Disk in Oil
D-M—Dry Multiple Disk
Pla—Plate (with multiplying levers)

Gearset Make:
B-L—Brown-Lipe
Chev—Chevrolet Motor Co.
Cov—Covert Gear Co.
Dt—Detroit Gear & Machinery Co.
Dodge—Dodge Bros.
Dur—Durston Gear Corp.
Ful——Fuller & Sons Mfg. Co.
G-L—Grant-Lees Gear Co.
Mech—Mechanics Machine Co.
Mun—Muncie Gear Works
War—Warner Gear Co.

Gearset Type:
C M—Constant Mesh
Ind—Individual Jaw Clutches
Plan—Planetary
S G—Sliding Gear

Gearset Location:
Sep Un—Separate Unit
Un W E—Unit with Engine
Un W J—Unit with Jackshaft

Universal Joint Make:
B Co.—Bearings Co. of America
Blood—Blood Brothers Machine Co.
East—Easton Machine Co.
Hart—Hartford Automotive Parts Co.
M & E—Merchant & Evans Co.
Mech—Mechanics Machine Co.
Nor—Norwalk Auto Parts Co.
Pet—Peters Machine & Mfg. Co.
Spi—Spicer Mfg. Corp.
Therm—Thermoid Rubber Co.
Uni—(Detroit) Universal Products
U M Co.—Universal Machine Co.

Universal Joint Type:
Fab—Fabric
Met—Metal

Front and Rear Axle Make:
Cen—Central Products Co.
Col—Columbia Axle Co.
Dodge—Dodge Brothers
Dun—Dunkirk Axle Corp.
Ent—Eaton (Standard Parts Co.)
Emp—Empire
I-M—Iron Mountain Co.
Olds—Olds Motor Works
Opt—Optional
Med—Medway Sales Corp.
Mid—Midwest Wheel & Axle Co.
Rus—Russel Motor Axle Co.
Sal—Salisbury Axle Co.
Sav—Savage
She—Sheldon Axle & Spring Co.
Shu—Shuler Axle Mfg. Co.
S-P—Standard Parts Co.
Tho—Thomson Press Co.
Tim—Timkin-Detroit Axle Co.
Tor—Torbensen Axle Co.
Vul—Vulcan Motor Axle Corp.
Wal—Walker Axle Co.
Wis—Wisconsin Gear & Axle Co.

Propulsion and Torque Taken by:
R R—Radius Rods
Sp—Springs
T A—Torque Arm
T T—Torque Tube

Final Drive Type:
B-S—Bevel-spur (double reduction)
B-S & Ch—Bevel-spur (double reduction) and Chain
Ch—Chain
I-G—Internal Gear
S-B—Spiral Bevel
St B—Straight Bevel

Front and Rear Springs Type:
El—Elliptic
½ E—Half Elliptic
¼ E—Quarter Elliptic
F C—Floating Cantilever
Pl—Platform
½ T—Transverse Half Elliptic

Brake Type and Location:
Dr—Driveshaft
Ext—External
Int—Internal
I & E—Internal & External
R & F—Rear and Front Wheels
R W—Rear Wheels

Steering Gear Make:
Dit—Ditweiler Mfg. Co.
Dodge—Dodge Bros.
Gem—Gemmer Mfg. Co.
Jac—Jacox (Saginaw Products Co.)
Lav—Lavine Gear Co.
Woh—Wohlrab Gear Co.

Steering Gear Type:
B P & S—Bevel Pinion and Sector
Plan—Planetary
S & N—Screw and Nut
W & S—Worm and Sector
W & W—Worm and Wheel

Wheels:
Arch—Archibald Wheel Co.
A-W—Auto-Wheel
Day—Dayton Automotive Wheel Co.
Dom—Dominion Wheel Co.
E & O—Eberly & Orris Mfg. Co.
Hoop—Hoopes Bros. & Darlington
Imp W Co.—Imperial Wheel Co.
Indes—Indestructible Wheel Co.
Med—Medway Sales Corp.
M W Co.—Motor Wheel Corp.
Mut—Mutual Wheel Co.
North—Northern Wheel Co.
Opt—Optional
Prud—Prudden
Roy—Royer Wheel Co.
San F—San Francisco Wheel Co.
St M—Saint Marys
Sch—Schwarz Wheel Co.
Smith—Smith & Co.
Stan—Standard Wheel Co.

Wheels Type:
Art—Artillery
C S—Cast Steel
P S—Pressed Steel

Frame Material:
P S—Pressed Steel
R S—Rolled Section

Specifications of American

Make and Model	Tons Capacity	Wheel-Base, Ins.	TIRE SIZE		ENGINE															ELECTRICAL SYSTEM		
												OILING SYSTEM		FUEL SYSTEM			GOVERNOR		SPEED				
			Front, Ins.	Rear, Ins.	Make	Number Cylinders, Bore and Stroke	Cylinders, Cast	Camshaft Drive Type	Radiator Core Make	Radiator Core Type	Water Circulation	Type	Oil Pump Type	Carbureter Make	Carbureter Size, Ins.	Fuel Feed	Make	Type	Motor in R.P.M.	Truck in M.P.H.	Generator Make	Ignition System, Make	Ignition System, Type
Collier	23	¾–1½	129	34x4½p	34x4½p	Cont	4-3½x5	4	Met-Gear	Long	Fin	Pump	Cir-Spl	Pist	Zenith	1	Vac					Eis	Eis	C-C
Collier	18	1	132	34x4	34x5	Cont	4-3½x5	4	Met-Gear	Long	Fin	Pump	Cir-Spl	Pist	Zenith	1	Vac	Mon	Suc			Eis	Eis	C-C
Collier	19	1½	144	36x4	36x6	Cont	4-3½x5	4	Met-Gear	Long	Fin	Pump	Cir-Spl	Pist	Zenith	1	Vac	Mon	Suc			Eis	Eis	C-C
Collier	22	2½	165	36x4	36x4d	Cont	4-4½x5½	4	Met-Gear	Long	Fin	Pump	Cir-Spl	Pist	Zenith	1½	Vac	Pier	Suc			Eis	Eis	C-C
Columbia	G	2½	148	36x4	36x7	Hink	4-4x5½	4	Met-Gear	Long	Fin	Pump	Hol-Crk	Gear	Stromb	1½	Vac	Hink	Cent	1200	14	West	Dixie	
Commerce	T	½	127	34x4½p	34x4½p	Cont	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl	Pist	Zenith	1	Vac			2200	40	Bijur	Eis	
Commerce	12	1½	130	35x5*	35x5*	Cont	4-3½x5	3	Met-Gear	Long	Fin	Ther	Cir-Spl	Pist	Zenith	1	Vac			2200	40	Bijur	Eis	
Commerce	16	2	137	35x5p	36x6p	Cont	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl	Pist	Zenith	1	Vac			2200	30	Bijur	Eis	
Commerce	18	2½	149	36x6p	38x7p	Cont	4-4½x5½	4	Met-Gear	Long	Fin	Pump	Cir-Spl	Pist	Zenith	1½	Vac				30	Eis	Eis	
Cook	51	2½		36x6p	40x8p	Her	4-4½x5½	4	Met-Gear	Chic	Fin	Pump	Hol-Crk	Gear			Vac			2000	35	West	Splitd	
Corbitt	H-22	1	130	34x3½	34x4	Cont	4-3½x5	4	Met-Gear	McCo	Fin	Ther	Cir-Spl	Gear	Stromb	1	Vac	Simp	Cent		18	Bijur	Eis	
Corbitt	E-22	1½	144	34x3½	34x5	Cont	4-3½x5	4	Met-Gear	McCo	PT	Ther	Cir-Spl	Gear	Stromb	1	Vac	Simp	Cent	1200	18	Bijur	Eis	
Corbitt	C-22	2	148	36x3½	36x7	Cont	4-4½x5½	4	Met-Gear	McCo	Fin	Pump	Cir-Spl	Pist	Stromb	1½	Vac	Simp	Cent		16	Eis	Eis	
Corbitt	B-22	2½	152	36x4	36x7	Cont	4-4½x5½	4	Met-Gear	McCo	Fin	Pump	Cir-Spl	Pist	Stromb	1½	Vac	Simp	Cent		16	Eis	Eis	
Corbitt	R-22	3	158	36x4	36x8	Cont	4-4½x5½	2	Met-Gear	McCo	Fin	Pump	Cir-Spl	Pist	Stromb	1½	Vac	Pier	Cent		15	Eis	Eis	
Corbitt	A-22	3½–4	178	36x5	36x10	Cont	4-4½x5½	2	Met-Gear	McCo	Fin	Pump	Cir-Spl	Pist	Stromb	1½	Vac	Pier	Cent		14	Eis	Eis	
Corbitt	AA-22	5	178	36x6	40x6d	Cont	4-4½x6	2	Met-Gear	McCo	Fin	Pump	Hol-Crk	Gear	Stromb	1½	Vac	Cont	Cent	950	12	Eis	Eis	
Day-Elder	A	1	128	35x5p	35x5p	Cont	4-3½x5	4	Met-Gear	Bush	Fin	Ther	Cir-Spl	Pist	Zenith	1½	Gra			1800	30	Eis	Eis	C-D
Day-Elder	B	1½–2	144	34x3½	34x5	Cont	4-3½x5	4	Met-Gear	Bush	Fin	Ther	Cir-Spl	Pist	Zenith	1½	Gra			1385	15	Eis	Eis	C-D
Day-Elder	D	2–2½	144	36x4	36x7	Cont	4-4½x5½	4	Met-Gear	Bush	Fin	Pump	Cir-Spl	Pist	Zenith	1½	Gra	Mon	Suc	1140	14	Eis	Eis	C-D
Day-Elder	C	2½–3	150	36x4	36x7	Buda	4-4½x5½	2	Met-Gear	Bush	Fin	Pump	Hol-Crk	Gear	Zenith	1½	Gra	Mon	Suc	1140	14	Eis	Eis	C-D
Day-Elder	F	3½–4	165	36x5	36x5d	Cont	4-4½x5½	2	Met-Gear	Bush	Fin	Pump	Cir-Spl	Gear	Zenith	1½	Gra	Mon	Suc	1150	12	Eis	Eis	C-D
Day-Elder	E	5–6	162	36x5	40x6d	Buda	4-4½x6	4	Met-Gear	Bush	Fin	Pump	Hol-Crk	Gear	Zenith	1½	Gra	Mon	Suc	860	10	Eis	Eis	C-D
Dearborn	E	1	132	35x5p	35x5p	Buda	4-3½x5½	4	N-M-G	Chic	Fin	Pump	Hol-Crk	Gear	Stromb	1	Vac			3500	45	West	Conn	C-C
Dearborn	F	1½	126	34x4	34x5	Buda	4-3½x5½	4	Met-Gear	Chic	Fin	Ther	Cir-Spl	Gear	Stromb	1	Vac			2600	28	West		O-C
Dearborn	48	2	141	34x4½p	34x7	Buda	4-3½x5½	4	Met-Gear	Chic	Fin	Ther	Cir-Spl	Gear	Stromb	1	Vac			2600	22½	West	Bosch	
Defiance	G	1	128	35x5p	35x5p	High	4-3½x5	4	Met-Gear	Perf	Cel	Pump	Hol-Crk	Gear	Stromb	1	Vac			2600		Aut-L	Eis	
Defiance	D	1½	140	35x5p	36x6p	High	4-3½x5	4	Met-Gear	Perf	Cel	Pump	Hol-Crk	Gear	Stromb	1	Vac					Aut-L	Eis	
Defiance	E	2	140	35x5p	38x7p	High	4-3½x5	4	Met-Gear	Perf	Cel	Pump	Hol-Crk	Gear	Stromb	1	Vac					Aut-L	Eis	
DeMartini	1½	1½		34x3½	34x6	Buda	4-3½x5½	4	Met-Gear	Flex	Cel	Ther	Cir-Spl	Gear	Zenith	1½	Vac			2500		Bosch	Bosch	
DeMartini	2	2	162	36x4	36x7	Buda	4-4½x5½	4	Met-Gear	Flex	Cel	Pump	Hol-Crk	Gear	Zenith	1½	Vac			1800		Bosch	Bosch	
DeMartini	3	3	168	36x5	36x10	Buda	4-4½x5½	4	Met-Gear	Flex	Cel	Pump	Hol-Crk	Gear	Zenith	1½	Vac			1200		Bosch	Bosch	
DeMartini	4	4	188	36x6	36x6d	Buda	4-4½x6	4	Met-Gear	Flex	Cel	Pump	Hol-Crk	Gear	Zenith	1½	Vac			1950		Bosch	Bosch	
Denby	31	¾	130	35x5p	35x5p	Cont	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl		Stromb	1	Gra			1900	25	Remy	Eis	S-P
Denby	33	1½	136	35x5p	38x7p	Cont	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl		Stromb	1	Gra			1600	26½	Remy	Eis	S-P
Denby	134	2	144	36x3½	36x6	Cont	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl		Stromb	1	Gra	Mon	Suc	1330	22½		Eis	S-P
Denby	25	3	150	36x4	37x7	Cont	4-4½x5½	4	Met-Gear	Long	Fin		Cir-Spl		Stromb	1½	Gra	Mon	Suc	1145	27		Eis	S-P
Denby	27	4	170	36x5	36x10	Cont	4-4½x5½	4	Met-Gear	Long	Fin		Cir-Spl		Stromb	1½	Gra	Dup	Cent	1090	32		Eis	S-P
Denby	210	5	170	36x6	40x12	Cont	4-4½x5½	4	Met-Gear	Long	Fin	Pump	Cir-Spl		Stromb	1½	Gra	Dup	Cent	1090	32		Eis	S-P
Dependable	C	1½	150	34x4	34x6	Buda	4-3½x5½	4	Com-Gear	Long	Fin	Pump	Hol-Crk	Gear	Zenith	1	Vac	Mon	Suc	1800			Splitd	S&O
Dependable	E	2½	165	36x4	36x7	Buda	4-4½x5½	4	Com-Gear	Long	Fin	Pump	Hol-Crk	Gear	Zenith	1½	Vac	Mon	Suc	1850			Splitd	S&O
Diamond T	03	1–1½	132	36x3½	36x4	Hink	4-3½x5½	4	Met-Gear	G&O	Fin	Pump	Hol-Crk	Gear	Stromb	1	Vac	Hink	Cent	1425	28	Bosch	Bosch	
Diamond T	FS	1½	144	36x3½	36x5	Hink	4-3½x5½	4	Met-Gear	G&O	Fin	Pump	Hol-Crk	Gear	Stromb	1	Vac	Hink	Cent	1425	18	Bosch	Bosch	
Diamond T	U	2	160	36x4	36x7	Hink	4-4x5½	4	Met-Gear	G&O	Fin	Pump	Hol-Crk	Gear	Stromb	1½	Vac	Hink	Cent	1425	16	Bosch	Bosch	
Diamond T	K	3½	170	36x5	36x5d	Hink	4-4½x5½	2	Met-Gear	G&O	Fin	Pump	Hol-Crk	Gear	Stromb	1½	Vac	Hink	Cent	1250	13	Bosch	Bosch	
Diamond T	EL	5	180	36x6	40x6d	Hink	4-4½x5½	2	Met-Gear	G&O	Fin	Pump	Hol-Crk	Gear	Stromb	1½	Vac	Hink	Cent	1250	12	Bosch	Bosch	
Diehl	B	1½	125	34x4½p	35x5*	H-S	4-3½x5	4	Met-Gear	Stan	Cel	Ther	Cir-Spl	Gear	Zenith	1½	Gra							
Dodge Brothers		½	114	32x4p	32x4p	Own	4-3½x4½	4	Met-Gear	McCo	PT	Pump	Cir-Spl	Gear	Stewart	1	Vac			2000		NE	NE	S&C
Dorris	K-4	2½	144	36x4	36x7	Own	4-4½x5½	4		McCo	Cel	Pump		Gear	Stromb		Vac	Own	Cent	1190	15	West	Bosch	S-P
Dorris	K-7	3½	154	36x5	36x10	Own	4-4½x5½	4		McCo	Cel	Pump		Gear	Stromb	1½	Vac	Own	Cent	1190	15		Bosch	S-P
Dort	103	½	105½	31x4p	31x4p	D-Lyc	4-3½x5	4	Met-Gear	Fed		Cel	Ther	Cir-Spl	Pist	Carter	1	Vac			2100	45	Bosch	Conn	C-C
Duplex	A	1½–2	145	35x5p	38x7p	Hink	4-4x5½	4	Met-Gear	Mod			Pump	Cir-Spl	Gear	Stromb	1½	Gra			2200	35	West	West	C-D
Duplex	E	3½	130	36x8	36x8	Buda	4-4½x5½	4	Met-Gear	Long	PT	Pump	Cir-Spl	Gear	Schebl	1½	Vac	Dup	Cent	1400	15			C-C
Duty		2	134	34x3½*	34x5*	Gray-B	4-3½x5	4				Cel	Ther		Gear	Zenith					2000	34			
F. W. D.	B	3	124	36x6	36x6	Wis	4-4½x5½	2	Met-Gear				Pump	Hol-Crk	Gear	Stromb	1½	Gra	Pier	Cent	1350	16	NE	Vend	S & C
Facto		2½	155	36x4*	36x8*	Buda	4-4½x5½	4	Met-Gear	Bush	Fin	Pump	Hol-Crk	Gear	Zenith	1¼	Gra	Pier	Cent	1300		West		O-C
Fageol	2	2	136	34x3½*	34x6*	Wau	4-3½x5½	4	Met-Gear	McCo	Fin	Pump	Cir-Spl	Gear	Zenith	1	Vac	Wau	Cent	1250	26	Splitd	Dixie	
Fageol	3	3	144	34x4*	36x7*	Wau	4-4½x5½	2	Met-Gear	McCo	Fin	Pump	Cir-Spl	Gear	Zenith	1½	Gra	Wau	Cent	1100	21	Splitd	Dixie	
Fageol	4	4	172	36x5*	36x5d*	Wau	4-4½x6½	2	Met-Gear	McCo	Fin	Pump	Hol-Crk	Gear	Zenith	1½	Vac	Wau	Cent	1000	17	Splitd	Dixie	
Fageol	6	6	172	36x6	40x6d	Wau	4-4½x6½	2	Met-Gear	McCo	Fin	Pump	Hol-Crk	Gear	Zenith	1½	Vac	Wau	Cent	1000	14	Splitd	Dixie	
Fargo	R	2	144	36x4	36x6	Cont	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl		Rayfld	1	Gra							
Federal	SD	1–1½	132	35x5p	36x6p	Cont	4-3½x5	4	Met-Gear			Fin	Pump	Hol-Crk	Gear	Zenith	1½	Vac	Pharo	Hyd	1450	25	Aut-L	Eis	C-C
Federal	TE	1½–2	144	36x3½	36x5	Cont	4-4½x5½	4	Met-Gear			Fin	Pump	Cir-Spl	Gear	Zenith	1½	Gra	Pharo	Hyd	1190	15	Aut-L	Eis	C-C
Federal	UE	2–2½	156	36x4	36x4d	Cont	4-4½x5½	2	Met-Gear			Fin	Pump	Cir-Spl	Gear	Zenith	1½	Gra	Pharo	Hyd	1120	13	Aut-L	Eis	C-C
Federal	WE	3½–4	154	36x5	36x5d	Cont	4-4½x5½	2	Met-Gear	Long	Fin	Pump	Cir-Sol	Gear	Zenith	1½	Gra	Pharo		1150	12		Eis	S-P
Federal	X-2	5–6	163	36x6	40x6d	Cont	4-4½x6	2	Met-Gear	Long	Fin	Pump	Hol-Crk	Gear	Zenith	1½	Vac	Pharo	Hyd	1100	12	Aut-L	Eis	S-P
Ford	TT	1	123	30x3½p	32x4½p	Own	4-3½x4	4	Met-Gear	Own	Fin	Ther	Cir-Spl		Own	1	Gra					Own	Own	O-C
Fulton	A	1	130	35x5p	35x5p	H-S	4-3½x5	4	Met-Gear	Liv	Cel	Ther	Cir-Spl		Carter	1	Gra					West	Mag	
Fulton	C	2	177	34x4	34x6	H-S	4-2½x5	4	Met-Gear	G&O	Cel	Ther	Cir-Spl	Gear	Carter	1	Gra			1700	18			
G. M. C.	K-16	1	132	34x5p	34x5p	Own	4-3½x5½	4	Met-Gear	McCo	Fin		Hol-Crk	Gear	Marvel	1½	Gra	Own	Cent	1485	25	Remy	Eis	
G. M. C.	K-41-A	2	146	36x4	36x7	Own	4-4x5½	4	Met-Gear	McCo	Fin		Hol-Crk	Gear	Marvel	1½	Gra	Own	Cent			Remy	Eis	
G. M. C.	K-71	3½	163	36x5	40x5d	Own	4-4½x6	4	Met-Gear	McCo	Fin	Pump	Hol-Crk	Gear	Marvel	1½	Gra	Own	Cent	1250		Remy	Eis	
G. M. C.	K-101	5	167	36x5	40x6d	Own	4-4½x6	4	Met-Gear	McCo	Fin		Hol-Crk	Gear	Marvel	1½	Gra	Own	Cent	1260	15	Remy	Eis	
G. W. W.	Farm-Special	1½	142	35x5p	35x5p	Wei	4-3½x5½	4		Own	Fin	Pump	Hol-Crk	Gear	Schebl	1½	Gra				40	Deleo	Deleo	C-C
Garford	15	¾	132	34x5p	34x5p	Buda	4-3½x5½	4		Long	Fin	Cent			Stromb		Gra			1800	30			
Garford	25	1½	135	36x3½	36x4	Buda	4-3½x5½	4			Fin	Cent	Cir-Spl		Stromb		Gra					West	Splitd	
Garford	75-H	2	144	36x4	36x7	Buda	4-4½x5½	4			Fin	Cent			Stromb		Gra	Sim	Cent	1085	15	West	Splitd	
Garford	77-D	3½	162	36x5	36x5d	Buda	4-4½x6	4			Fin	Cent			Stromb		Gra	Sim	Cent	1144	14	West	Splitd	
Garford	68-D	5	128	36x6	40x6d	Wis	4-4½x5½	2				Cent			Rayfld		Gra	Sim	Cent	1057	11			
Gary	F	1	130	36x3½	36x4	Buda	4-3½x5	4	Met-Gear		Fin	Ther	Hol-Crk	Gear	Master	1	Vac	McCan	Suc	1050	20	Opt	Eis	D-P
Gary	I	1½	144	36x3½	36x5	Buda	4-4x5½	4	Met-Gear		Fin		Hol-Crk	Gear	Master	1½	Vac	McCan	Suc	980	18			D-P
Gary	J	2½	148	36x4	36x7	Buda	4-4½x5½	4	Met-Gear		Fin	Pump	Hol-Crk	Gear	Master	1½	Vac	McCan	Suc	1350	15		Eis	D-P
Gary	K	3½	162	36x5	40x5d	Buda	4-4½x6	4	Met-Gear		Fin	Pump	Hol-Crk	Gear	Master	1½	Vac	McCan	Suc		12			D-P
Gary	M	5	182	36x6	40x6d	Buda	4-5½x6½	4	Met-Gear		Fin	Pump	Hol-Crk	Gear	Master	1½	Vac	McCan	Suc	1200	10			D-P
Gersix	K	2½	150	36x4*	36x8	Buda	4-4½x5½	4	Met-Gear	Ideal	Cel	Pump	Hol-Crk	Gear	Stromb	1½	Vac	Mon	Suc	1320	15	G&D	Bosch	S & C
Graham Brothers		1	140	33x4½p	34x5p	Dodge	4-3½x4½	4	Met-Gear	McCo	Fin	Pump	Cir-Spl	Ecc	Stewart		Vac					NE	NE	S & D
Gramm-Pioneer	10	1	129	33x5p	33x5p	Lyc	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl		Stromb	1	Gra			2400	50	Aut-L	Conn	C-C
Gramm-Pioneer	15	1½	138	36x3½	36x5	Cont	4-3½x5	4	Met-Gear	Long	Fin	Ther	Cir-Spl	Pist	Stromb	1	Gra			1600	25	NE	NE	C-C
Hahn	J-4	1	132	34x5*	34x5*	Cont	4-3½x5	...		Chic	Fin	Pump	Hol-Crk					Pharo		1200		Delco	Delco	
Hahn	CD	1½	155	36x3½*	36x5*	Cont	4-4½x5½	...		Chic	Fin	Pump	Hol-Crk	Gear		1½	Gra	Pharo		1400		Delco		
Hahn	DE	2	158	36x4*	36x7*	Cont	4-4½x5½	...		Chic	Fin	Pump	Hol-Crk	Gear		1½	Gra	Pharo		1400		Delco		
Hahn	EE	2½	162	36x4*	36x8*	Cont	4-4½x5½	2		Chic	Fin	Pump	Hol-Crk	Gear		1½	Gra	Pharo		1400		Delco		
Hahn	F	3½	191	36x5*	36x10*	Cont	4-4½x5½	...		Chic	Fin	Pump	Hol-Crk	Gear		1½	Gra	Pharo	Cent	1400				

For abbreviations, see pages 350 and 351.

Trucks (Continued)

CLUTCH		TRANSMISSION											SPRINGS		BRAKES		STEERING		WHEELS			
		GEARSET				UNIVERSAL JOINTS		AXLES														
Make	Type	Make	Type	Location	Forward Speeds	Make	Type	Front Make	Rear Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Final Drive Type	Front	Rear	Service	Emergency	Steering Gear Make	Steering Gear Type	Make	Type	Frame Material	Make and Model
Ful	D-M	Ful	SG	Un-WE		Uni	Met	Sal	Sal	5.50	Sp	Sp	S-B	½E	½E	ExtR-W	IntR-W	Ross	S&N	Bimel	Art	P-S	**Collier 23**
Ful	D-M	Ful	SG	Un-WE	3	Uni	Met	Tim	Tim	7.50	Sp	Sp	Worm	½E	½E	Ext	Int	Ross	S&N	Bimel	Art	P-S	**Collier 18**
Ful	D-M	Ful	SG	Un-WE		Uni	Met	Tim	Tim	7.50	Sp	Sp	Worm	½E	½E	Int	Int	Ross	S&N	Bimel	Art	R-S	**Collier 19**
Ful	D-M	Ful	SG	Un-WE	3	Uni	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	Ext	Int	Ross	S&N	Bimel	Art	R-S	**Collier 22**
M&E	D-M	Cotta	CM	Sep-Un	4	Spi	Met	Shu	Rus	9.45	Sp	Sp	Int	½E	½E	ExtR-W	IntR-W	Own	W&W	Detroit	Art	R-S	**Columbia G**
DG&M	Con	DG&M	SG	Un-WE	3	Spi	Met	Sal	Sal	5.70	Sp	Sp	S-B	½E	½E	ExtR-W	IntR-W	Jac	S&N			P-S	**Commerce T**
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Sal	Tor	8.00	Sp	Sp	I-G	½E	½E	ExtR-W	IntR-W	Jac	S&N		Art	P-S	**Commerce 12**
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Sal	Tor	9.00	Sp	Sp	I-G	½E	½E	Ext	Int	Jac			Art	P-S	**Commerce 16**
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tor	Tor	9.00	Sp	Sp	I-G	½E	½E	ExtR-W	IntR-W	Jac	S&N		Art	P-S	**Commerce 18**
B&B	Pla	B-L	SG	Un-WE	4	Own	Fab	Tim	Opt	7.00	Sp	Sp		½E	½E	R-W	R-W	Woh	S&N		C-S	P-S	**Cook 51**
B-L	D-M	B-L	SG	Un-WE	3	Hart	Met	She	She	5.50	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	**Corbitt H22**
B-L	D-M	B-L	SG	Un-WE	3	Hart	Met	She	She	6.50	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	**Corbitt E22**
B-L	D-M	B-L	SG	Un-WE	3	Hart	Met	She	She	8.67	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	**Corbitt C22**
B-L	D-M	B-L	SG	Un-WE	4	Hart	Met	She	She	8.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	**Corbitt B22**
B-L	D-M	B-L	SG	Un-WE	4	Hart	Met	She	She	8.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	**Corbitt R22**
B-L	D-M	B-L	SG	Un-WE	4	Hart	Met	She	She	11.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	**Corbitt A22**
Det	D-M	B-L	SG	Sep-Un	4	Hart	Met	She	She	10.25	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	**Corbitt AA22**
Cov	D-M	Cov	SG	Un-WE	3	Hart	Met	She	She	6.50	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Jones	Art	P-S	**Day-Elder A**
Cov	D-M	Cov	SG	Un-WE	3	Hart	Met	Col	She	8.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Jones	Art	P-S	**Day-Elder B**
Cov	D-M	Cov	SG	Un-WE	4	Hart	Met	Col	She	8.66	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Jones	Art	P-S	**Day-Elder D**
Cov	D-M	Cov	SG	Un-WE	4	Hart	Met	She	She	8.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Jones	Art	P-S	**Day-Elder C**
B-L	D-M	B-L	SG	Un-WE	4	Hart	Met	Col	She	10.25	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Jones	Art	P-S	**Day-Elder F**
B-L	D-M	B-L	SG	Sep-Un	4	Hart	Met	She	She	10.25	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Jones	Art	P-S	**Day-Elder E**
Ful	D-M	Ful	SG	Un-WE	3	Hart	Met	Tor	Wis	6.20	Sp	Sp	Worm	½E	½E	Int	Int	Dit	W&W	Own	Art	R-S	**Dearborn E**
Ful	D-M	Ful	SG	Un-WE		Hart	Met	Tor	Wis	7.50	Sp	Sp	Worm	½E	½E	Int	Int	Dit	W&W	Own	Art	P-S	**Dearborn F**
Ful	D-M	Ful	SG	Un-WE		Hart	Met	Tor	Wis	9.60	Sp	Sp	Worm	½E	½E	Int	Int	Dit	W&W	Own	Art	R-S	**Dearborn 48**
B&B	Pla	G-L	SG	Un-WE	3	Arvac	Met	Eat	Eat	5.25	Sp	Sp	S-B	½E	½E	IntR-W	IntR-W	Own	W&W	StM	Art	P-S	**Defiance G**
B&B	Pla	G-L	SG	Un-WE	3	Arvac	Met	Col	Tor	7.00	Sp	Sp	I-G	½E	½E	ExtR-W	IntRM-	Own	W&W	StM	Art	P-S	**Defiance D**
B&B	Pla	G-L	SG	Un-WE	3	Arvac	Met	Col	Tor	8.00	Sp	Sp	I-G	½E	½E	ExtR-W	IntR-W	Own	W&W	StM	Art	P-S	**Defiance E**
B-L	D-M	B-L	SG	Un-WE		Spi	Met	She	She		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N		Art	R-S	**DeMartini 1½**
B-L	D-M	B-L	SG	Un-WE		Spi	Met	She	She		RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-C	R-S	**DeMartini 2**
B-L	D-M	B-L	SG	Un-WE	4	Spi		She	She		RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	**DeMartini 3**
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	**DeMartini 4**
Ful	D-M	Ful	SG	Un-WE	3	Uni	Met	She	Col	5.85	Sp	Sp	S-B	½E	½E	ExtR-W	IntR-W	Ross	S&N	MWC	Art	P-S	**Denby 31**
Ful	D-M	Ful	SG	Un-WE	3	Uni	Met	Tim	Clark	6.83	Sp	Sp	I-G	½E	½E	ExtDr	ExtR-W	Gem	W&W	MWC	Art	P-S	**Denby 33**
Ful	D-M	Ful	SG	Un-WE	4	Uni	Met	Tim	Rus	10.20	Sp	Sp	I-G	½E	½E	ExtDr	ExtR-W	Gem	W&W	MWC	Art	P-S	**Denby 134**
Ful	D-M	Ful	SG	Un-WE	4	Uni	Met	S-P	Rus	9.45	Sp	Sp	I-G	½E	½E	ExtDr	ExtR-W	Gem	W&W	Smith	C-S	P-S	**Denby 25**
Own	D-M	War	SG	Sep-Un	4	Uni	Met	S-P	Clark	10.00	SP	Sp	I-G	½E	½E	ExtR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	**Denby 27**
Own	D-M	War	SG		4	Pet	Met	S-P	Clark	12.55	Sp	Sp	I-G	½E	½E	ExtDr	IntR-W	Ross	S&N	Clark	C-S	P-S	**Denby 210**
Ful	D-M	Ful	SG	Un-WE	3	Arvac	Met	Shu	Wis	8.25	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	P-S	**Dependable C**
Ful	D-M	Ful	SG	Sep-Un	4	Arvac	Met	Shu	Wis	8.66	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	P-S	**Dependable E**
Cov	D-M	Cov	SG	Un-WE		Spi	Met	Tim	Own	6.20	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Sch	Art	P-S	**Diamond T 03**
Cov	D-M	Cov	SG	Un-WE	4	Spi	Met	Tim	Wis	8.25	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Sch	Art	P-S	**Diamond T FS**
Cov	D-M	Cov	SG	Un-WE			Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Sch	Art	P-S	**Diamond T U**
Cov	D-M	Cov	SG	Sep-Un	4	Spi	Met	Tim	Tim		Sp	Sp	Worm	½E	½El	IntR-W	IntR-W	Gem	W&W	Smith	C-S	P-S	**Diamond T K**
Cov	D-M	Cov	SG	Sep-Un	4	Spi	Met	Tim	Tim	11.66	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Smith	C-C	P-S	**Diamond T EL**
M&E	D-M	Dur	SG	Un-WE	3	M&E	Met	Sal	Tor	6.33	Sp	Sp	I-G	½E	½E	Ext	Int	Ross	S&N	Wayne	Art	P-S	**Diehl B**
Own	D-M	Own	SG	Un-WE	3	Own	Met	Own	Own	4.16	Sp	TT	S-B	½E	½E	Ext	Int	Own	W&W	Kelsey	Art	P-S	**Dodge Brothers**
Own	D-M	War	SG	Un-WE	3	Spi	Met	Tim	Tim	7.75	Sp	Sp	Worm	½E	½E	Int	Int	Ross	S&N	Smith	C-S	P-S	**Dorris K4**
Own	D-M			Un-WE	3	Spi	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	Int	Int	Ross	S&N	Smith	C-S	P-S	**Dorris K7**
Det	D-M	Own	SG	Un-WE	3	Mec	Met	Flint	Flint	4.45	Sp	TT	S-B	½E	FC	Ext	Int	Jac	S&N	ImpWC	Art	P-S	**Dort 103**
Cov	D-M	Cov	SG	Un-WE	3	Pet	Met	She	She	6.50	Sp	Sp	Worm	½E	½E	Int	Int	Ross	S&N	MWC	Art	P-S	**Duplex A**
B-L	D-M	B-L	SG	Un-WE	4	Pet	Met	Own	Own	8.00	RR	Sp	I-G	½E	½E	ExtDr	R-W	Woh	S&N	MWC	Art	P-S	**Duplex E**
Cov	D-M																						**Duty**
Hele	D-M	Cotta	CM	Sep-Un	3	Blood	Met	Own	Own	8.90	Sp	TA	StB	½E	Pl	ExtR&F	ExtR-W	Ross	S&N	Sch	Art	P-S	**F. W. D. B**
Ful	D-M	Ful	SG	Sep-Un	4	Spi	Met	Tim	Tim	7.75	Sp	Sp	Worm	½E	½E	Int	Int	Ross	S&N	Smith	C-S	P-S	**Facto**
Det	D-M	Own	SG	Un-WE	5			Eat	Eat	7.80	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Prud		R-S	**Fageol 2**
Det	D-M	Own	SG	Sep-Un	5			Tim	Tim	7.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Prud		R-S	**Fageol 3**
Det	D-M	Own	SG	Sep-Un	5			Tim	Tim	10.33	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Prud		P-S	**Fageol 4**
Det	D-M	Own	SG	Sep-Un	5			Tim	Tim	11.66	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Prud		P-S	**Fageol 6**
Ful	D-M	Ful	SG	Un-WE		Spi		Shu	Rus	9.40	Sp	Sp	I-G	½E	½E	ExtR-W	IntR-W	Jac	S&N		Art	R-S	**Fargo R**
B&B	Pla	Own	SG	Sep-Un	3	Pet	Met	Own	Tim	7.20	RR	Sp	Worm	½E	½E	R-W	R-W	Gem	W&W	Dist	P-S	P-S	**Federal SD**
B&B	Pla	DG&M	SG	Sep-Un	4	Spi	Met	Own	Tim	8.50	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Sch	Art	Wd	**Federal TE**
B&B	Pla	DG&M	SG	Sep-Un	4	Spi	Met	Own	Tim	9.25	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Sch	Art	P-S	**Federal UE**
B&B	Pla	War	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.25	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Smith	C-S	P-S	**Federal WE**
B&B	Pla	War	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.25	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Smith	C-S	P-S	**Federal X2**
Own	D-M	Own	Plan	Un-WE	2	Own	Met	Own	Own	7.25	TT	TT	Worm	½E	½E	Dr	R-W	Own	Plan		Art	P-S	**Ford TT**
B&B	Pla	Dur	SG	Un-WE		Spi	Met	Col	Col	6.80	Sp	Sp	S-B	½E	½E	R-W	R-W	Lav	S&N	Hoopes	Art	P-S	**Fulton A**
Cov	D-M	Cov	SG	Un-WE		Uni	Met	Col	Rus	10.80	Sp	Sp	I-G	½E	½E	ExtR-W	Dr	Lav	S&N	Hoopes	Art	P-S	**Fulton C**
Own	D-M	Own	SG	Un-WE	3	Uni	Met	Own	Own	6.00	RR	Sp	StB	½E	½E	Ext	Int	Own	S&N	Kelsey	Art	P-S	**G. M. C. K16**
Own		Own	SG	Un-WE	7	Own	Met	Tim	Tim	7.25	RR	Sp	Worm	½E	½E	Int	Int	Own	S&N	Own	C-S	P-S	**G. M. C. K41A**
Own	D-M	Own	SG	Sep-Un	7	Own	Met	Tim	Tim	8.75	RR	Sp	Worm	½E	½E	Int	Int	Own	S&N	Own	C-S	P-S	**G. M. C. K71**
Own	D-M	Own	SG	Sep-Un	7	Own	Met	Tim	Tim	10.00	RR	Sp	Worm	½E	½E	Int	Int	Own	S&N	Own	C-S	P-S	**G. M. C. K101**
Ful	D-M	Ful	SG	Un-WE	3	Acme	Met	Shu	Clark	7.00	Sp	Sp	I-G	½E	½E	Ext	Int	Woh	W&S	Roy	Art	R-S	**G. W. W. Farm Special**
B&B	Pla	Own	SG	Un-WE	3	Spi	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W				Art	P-S	**Garford 15**
B-L	D-M	Own	SG	Sep-Un	3			Own	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross			Art	P-S	**Garford 25**
B-L	D-M	Own	SG	Sep-Un	4	Spi	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross			Art	P-S	**Garford 70H**
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross		Smith	C-S	P-S	**Garford 77D**
B-L	D-M	Own	SG	Un-WJ	4	Spi	Met	Tim	Own		RR	Sp	Ch	½E	½E	IntR-W	ExtDr	Ross		Smith	C-S	P-S	**Garford 68D**
Ful	D-M	Ful	SG	Un-WE			Met	Tim	Tim	7.20	Sp	Sp	Worm	½E	½E	Int	Int	Ross	S&N		Art	P-S	**Gary F**
Ful	D-M	Ful	SG	Un-WE	3		Met	Tim	Tim	7.25	Sp	Sp	Worm	½E	½E	Int	Int	Ross	S&N		Art	P-S	**Gary I**
Ful	D-M	Ful	SG	Un-WE	4	Spi	Met	Tim	Tim	8.50	RR	Sp	Worm	½E	½E	Int	Int	Ross	S&N		Art	P-S	**Gary J**
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.30	RR		Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	**Gary K**
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	11.70	RR		Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	**Gary M**
B&B	Pla	Cotta	CM	Un-WE	3	Blood	Met	She	Own	9.66	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Jones	Art	R-S	**Gersix K**
Dodge	D-M	Dodge	SG	Un-WE	3		Met	Dodge	Own	6.28	Sp	Sp	S-B	½E	½E	ExtR-W	IntR-W	Dodge	W&W		Art	P-S	**Graham Brothers**
B&B	Pla	Warren	SG	Un-WE	3	Nor	Fab	Sal	Sal	5.75	Sp	Sp	S-B	½E	½E	ExtR-W	ExtDr		S&N			P-S	**Gramm-Pioneer 10**
Ful	D-M	Ful	SG	Un-WE	3	Snead	Fab	Col	Clark	7.80	Sp	Sp	I-G	½E	½E	ExtR-W	IntR-W	Ross	S&N	Bimel	Art	P-S	**Gramm-Pioneer 15**
B-L	D-M	B-L	SG	Un-WE		Spi	Met	She	She		Sp	Sp	Worm	½E	½E	Int	Int	Ross				P-S	**Hahn J4**
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	Tim	Tim	7.00	RR		Worm	½E	½E	IntR-W	IntR-W	Ross				P-S	**Hahn CD**
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	Tim	Tim	9.00			Worm	½E	½E	IntR-W	IntR-W	Ross				P-S	**Hahn DE**
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	7.75			Worm	½E	½E	IntR-W	IntR-W	Ross				P-S	**Hahn EE**
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.25			Worm	½E	½E	IntR-W	IntR-W	Ross				P-S	**Hahn F**

For abbreviations, see pages 350 and 351.

Specifications of American

Make and Model	Tons Capacity	Wheel-Base, Ins.	TIRE SIZE		ENGINE							OILING SYSTEM		FUEL SYSTEM			GOVERNOR		SPEED		ELECTRICAL SYSTEM		
			Front, Ins.	Rear, Ins.	Make	Number Cylinders. Bore and Stroke	Cylinders, Cast	Camshaft Drive Type	Radiator Core Make	Radiator Core Type	Water Circulation	Type	Oil Pump Type	Carbureter Make	Carbureter Size, Ins.	Fuel Feed	Make	Type	Motor in R.P.M.	Truck in M.P.H.	Generator Make	Ignition System, Make	Ignition System, Type
Hal-Fur.....D	1½	144	34x5•	38x7•	Hink....	4-4x5½	4	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1350	45	West..	Bosch..	S-P...
Hal-Fur.....B	2½	168	36x6p	36x10	Hink....	4-4½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1350	30	West..	Bosch..	S-P...
Hal-Fur.....F	3½	180	36x6	40x12	Hink....	4-4½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1350	25	West..	Bosch..	S-P...
Hall.....2½	2½	156	36x4	36x4d	Cont....	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Zenith..	1½	Gra...	Dup....	Cent..	1400	22	Eis....	.....	O-C...
Hall.....3½	3½	144	36x5•	36x5d•	Cont....	4-4½x5½	2	Met-Gear..	.....	.....	Pump.	Cir-Spl..	Pist...	Zenith..	1•	Gra...	Dup....	Cent..	1300	18	.....	Eis....	O-C...
Hall.....5	5	144	36x5	40x6d	Cont....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Zenith..	1½	Gra...	Dup....	Cent..	1300	15	Eis....	Eis....	O-C...
Hall.....7 Chain	7	144	36x5	40x6	Cont....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Zenith..	1½	Gra...	Dup....	Cent..	1300	15	Eis....	.....	.....
Harvey.....WOA	2	160	34x4	34x7	Buda....	4-4½ 5½	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Ecc...	Stromb..	1½	Gra...	Mec....	Suc..	1200	16	.....	.....	.....
Harvey.....WFA	2½	150	36x4	36x7	Buda....	4-4½x5½	4	Met-Gear..	.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Mec....	Suc..	1200	16	.....	.....	.....
Harvey.....WHA	3½	160	36x5	36x5d	Buda....	4-4½x6	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Mec....	Suc..	1000	13	.....	.....	.....
Hawkeye.....K	1½	148	34x3½•	34x5•	Buda....	4-3½x5½	4	Met-Gear..	Ideal....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Simp....	Cent..	1400	17	.....	.....	.....
Hawkeye.....M	2	148	36x4•	36x6•	Buda....	4-4½x5½	4	Met-Gear..	Bre....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Simp....	Cent..	1200	15	Eis....	Eis....	.....
Hawkeye.....N	3½	170	36x5	36x10	Buda....	4-4½x6	4	Met-Gear..	Ideal....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith..	1¼	Gra...	Simp....	Cent..	1200	12	Eis....	Eis....	.....
Hendrickson.....	1½	130	36x4p	36x5p	Buda....	4-3½x5½	...	.....	.....	.....	Pump.	.....	.....	Stromb..	....	.....	.....	Suc..	.....	.....	.....	Splitd..	.....
Hendrickson.....	2½	140	36x4	36x7	Buda....	4—4½x5½	...	.....	.....	.....	Pump.	.....	.....	Stromb..	....	.....	.....	Suc..	.....	.....	.....	Splitd..	.....
Hendrickson.....	3½	165	36x5	36x5	Buda....	4-4½x5½	...	.....	.....	.....	Pump.	.....	.....	Stromb..	....	.....	.....	Suc..	.....	.....	.....	Splitd..	.....
Hendrickson.....	5	170	36x6	40x6d	Wau....	4-5x6½	...	.....	.....	.....	Pump.	.....	.....	Stromb..	....	.....	.....	.....	.....	.....	.....	Splitd..	.....
Huron, Erie.....	1½–2	144	35x5p	38x7p	Buda....	4-3½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1	Vac...	Pier....	Cent..	1400	25	NE....	Bosch..	.....
Huron.....Mich.	2½–3	156	36x6p	40x8p	Buda....	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1¼	Vac...	Pier....	Cent..	1400	22	NE....	Bosch..	.....
Indiana.....12	1½	134	34x3½	34x5	Wau....	4-3½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Gra...	Wau....	Cent..	1300	20	West..	Eis....	.....
Indiana.....20	2	150	36x4	36x7	Own....	4-4½x5½	2	Com-Gear.	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Pier....	Cent..	1160	15	West..	Eis....	.....
Indiana.....25	2½	156	36x4	36x8	Own....	4-4½x5½	2	Com-Gear.	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Pier....	Cent..	1600	15	West..	Eis....	.....
Indiana.....35	3½	160	36x5	36x5d	Own....	4-4½x5½	2	Com-Gear.	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Pr....	Pier....	Cent..	1150	12	West..	Eis....	.....
Indiana.....51	5	170	36x5	40x6d	Wau....	4-5x6½	2	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Wau....	Cent..	1000	12	West..	Eis....	.....
International.....S	¾	124½	34x5p	34x5p	Lyc....	4-3½x5	4	Met-Gear..	Long....	Fin...	Ther..	Cir-Spl..	Pist...	Ensign..	1½	Gra...	.....	.....	2000	35	Aut-L..	Conn...	S&C...
International.....21	1	115	36x3½	36x3½	Own....	4-3½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Ensign..	1½	Gra...	Own....	Cent..	1450	22	NE....	Bosch..	S&C...
International.....31	1½	129	36x3½	36x4	Own....	4-3½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Ensign..	1½	Gra...	Own....	Cent..	1450	19	NE....	Bosch..	S&C...
International.....41	2	129	36x3½	36x5	Own....	4-3½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Ensign..	1½	Gra...	Own....	Cent..	1450	15	NE....	Bosch..	S&C...
International.....61	3	138½	36x4	36x6	Own....	4-4½x5	4	Met-Gear..	Long....	Fin...	Ther..	Cir-Spl..	Pist...	Ensign..	1½	Gra...	Own....	Cent..	1275	15	NE....	Dixie..	S&C...
International.....101	5	160	36x5	40x10	Own....	4-4½x5	4	Met-Gear..	Long....	Fin...	Ther..	Cir-Spl..	Pist...	Ensign..	1½	Gra...	Own....	Cent..	1275	14	NE....	Dixie..	S&C...
K-Z.....1	1	134	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	Cir-Spl..	.....	Stromb..	1	Gra...	McCan..	Suc..	....	....	.....	.....	.....
K-Z.....1½	1½	134	36x4	36x6	Cont....	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	Cir-Spl..	.....	Stromb..	1	Gra...	McCan..	Suc..	....	....	.....	.....	.....
K-Z.....2½	2½	150	36x6	36x8	Cont....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Mec....	Suc..	....	....	.....	.....	.....
K-Z.....3½	3½	156	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	McCan..	Suc..	....	....	.....	.....	.....
K-Z.....5	5	156	36x6	40x12	Cont....	4-4½x6	2	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	McCan..	Suc..	....	....	.....	.....	.....
Kalamazoo.....G1	1½	144	34x4	34x5	Cont....	4-3½x5	4	Met-Gear..	Hoo....	Cel...	Ther..	Cir-Spl..	Pist...	Stromb..	1½	Vac...	Pier....	Cent..	1300	20	Dyn....	Conn...	S-P...
Kalamazoo.....H	2½	160	36x4	36x8	Wis....	4-4x6	4	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Fear..	Stromb..	1½	Vac...	Pier....	Cent..	1300	15	Dyn....	Bosch..	S-P...
Kalamazoo.....K	3½	160	36x5	36x10	Wis....	4-4½x6	4	Met-Gear..	.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1300	12	Dyn....	Bosch..	S-P...
Kalamazoo.....K5	5	160	36x6	36x6d	Wis....	4-4½x6	4	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1300	12	Dyn....	Bosch..	S-P...
Kearns.....H	1	118	32x4½p	32x4½p	H-S.....	4-3½x4½	4	.....	.....	Cel...	Ther..	Cir-Spl..	.....	Zenith..	1¼	Vac...	.....	.....	2000	40	Dyn....	Berlg..	S-P...
Kearns.....N	2	136	34x3½	34x6	H-S.....	4-3½x5	4	.....	.....	Fin...	Ther..	Cir-Spl..	.....	Zenith..	....	Vac...	.....	.....	1800	20	Dyn....	.....	.....
Kelly-Springfield....K34	1½	144	36x3½	36x6	Own....	4-3½x5½	4	.....	.....	Fin...	Pump.	.....	Gear..	Zenith..	....	.....	.....	.....	1600	....	Eis....	.....	.....
Kelly-Springfield....K38	2½	150	36x4	36x4d	Own....	4-3½x5½	4	.....	.....	Fin...	Pump.	.....	Gear..	Zenith..	....	.....	.....	.....	1600	16	Eis....	.....	.....
Kelly-Springfield....K41	3½	156	36x5	40x5d	Own....	4-4½x6½	2	.....	.....	Fin...	Pump.	.....	.....	Zenith..	....	.....	.....	Cent..	1300	15	Eis....	.....	.....
Kelly-Springfield....K50	5	158	36x6	40x6d	Own....	4-4½x6½	2	.....	.....	Fin...	Pump.	.....	.....	Zenith..	....	.....	.....	Cent..	1300	13	Eis....	.....	.....
Kelly-Springfield....K60	6	158	36x6	40x7d	Own....	4-4½x6½	2	.....	.....	Fin...	Pump.	.....	.....	Zenith..	....	.....	.....	Cent..	1300	13	Eis....	.....	.....
Keystone.....	2	144	34x5•	38x7•	Buda....	4-3½x5½	4	Met-Gear..	McCo...	PT...	Ther..	Cir-Spl..	Gear..	Zenith..	1	Gra...	Pier....	Cent..	1350	17	G&D..	Berlg..	C-C...
Kimball.....AB	2	136	36x4	36x7	Wis....	4-4x6	4	Met-Gear..	Eagle...	PT...	Pump.	Hol-Crk.	Gear..	Master..	1½	Vac...	.....	.....	1600	17	West..	Eis....	.....
Kimball.....AK	3	172	36x5	36x10	Wis....	4-4½x6	4	Met-Gear..	Eagle...	PT...	Pump.	Hol-Crk.	Gear..	Master..	1½	Vac...	.....	.....	.....	16	West..	Splitd..	.....
Kimball.....AE	4	164	36x5	40x6d	Wis....	4-4½x6	2	Met-Gear..	Eagle...	PT...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Vac...	.....	.....	.....	.....	West..	Splitd..	.....
Kimball.....AF	5	164	36x6	40x7d	Wis....	4-5x6	2	Met-Gear..	Eagle...	PT...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Vac...	.....	.....	.....	12	West..	Splitd..	.....
Kissel.....Express	1	140	34x5p	34x5p	Own....	4-3½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac...	.....	.....	.....	.....	Remy..	Remy..	S&O...
Kissel....General Utility	1½	152	36x3½	36x5	Own....	4-3½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1400	12	.....	.....	.....
Kissel.....Freighter	2½	168	36x4	36x7	Own....	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1400	12	.....	.....	.....
Kissel.....Heavy Duty	3½	168	36x5	36x5d	Own....	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac...	Pier....	Cent..	1400	12	.....	.....	.....
Kleiber.....	1	140	34x3½	34x5	Cont....	4-4½x5½	4	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Pist...	Stromb..	1½	Gra...	Simp....	Cent..	.....	.....	.....	.....	.....
Kleiber.....	1½	147	36x3½	36x6	Cont....	4-4½x5½	4	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Pist...	Stromb..	1½	Gra...	Simp....	Cent..	.....	.....	.....	.....	.....
Kleiber.....	2	156	36x4	36x7	Cont....	4-4½x5½	4	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Pist...	Stromb..	1½	Gra...	Simp....	Cent..	.....	.....	.....	.....	.....
Kleiber.....	2½	160	36x5	36x8	Cont....	4-4½x5½	2	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Pist...	Stromb..	1½	Gra...	Simp....	Cent..	.....	.....	.....	.....	.....
Kleiber.....	3½	167	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Pist...	Stromb..	1½	Gra...	Simp....	Cent..	.....	.....	.....	.....	.....
Kleiber.....	5	180	36x6	40x12	Buda....	4-5x6½	4	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Pist...	Stromb..	1½	Gra...	Simp....	Cent..	.....	.....	.....	.....	.....
Koehler.....D	1½	137	34x3½	34x5	H-S.....	4-3½x5	4	Met-Gear..	Gor.....	Cel...	Ther..	.....	Gear..	Zenith..	1	Gra...	Simp....	Cent..	1275	18	West..	Splitd..	C-C...
Koehler.....M	2½	165	36x4	36x7	Her.....	4-4x5½	4	Met-Gear..	Gor.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Simp....	Cent..	1375	16	West..	Splitd..	C-C...
Koehler.....F	3½	162	36x5	36x5d	Her.....	4-4½x5½	4	Met-Gear..	Gor.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Vac...	Pier....	Cent..	1350	14	West..	Splitd..	C-C...
Lange.....EA	2½	153	36x4•	36x7•	Cont....	4-4½x5½	4	Met-Gear..	Mod....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	....	Vac...	Simp....	Cent..	1300	15	.....	Bosch..	O-C...
Larrabee.....X2	1	138	34x5p	34x5p	Cont....	6-3½x4½	6	Met-Gear..	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith..	1	Gra...	.....	.....	.....	....	Bosch..	Bosch..	O-C...
Larrabee.....J4	1½	138	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1	Gra...	Pharo...	Hyd..	....	18	Bosch..	Bosch..	.....
Larrabee.....K4	2½	158	36x4	36x8	Cont....	4-4½x5½	4	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Pharo...	Hyd..	1225	15	Bosch..	Bosch..	.....
Larrabee.....L4	3½	160	36x5d.	36x5d	Cont....	4-4½x5½	2	Met-Gear..	Rome-T.	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Pharo...	Hyd..	1260	13	Bosch..	Bosch..	.....
Larrabee.....W	5	185	36x6	40x6d	Cont....	4-4½x6	2	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Pharo...	Hyd..	1100	10	Bosch..	Bosch..	.....
Luedinghaus.....C	1	130	35x5p	35x5p	H-S.....	4-3½x5	4	Met-Gear..	Bre.....	Fin...	Pump.	Cir-Spl..	Gear..	Schebl..	1	Gra...	.....	.....	.....	35	Dyn....	At-K...	O-C...
Luedinghaus.....W	1½	144	34x3½•	34x5•	Wau....	4-3½x4½	4	Met-Gear..	Bre.....	Fin...	Pump.	Cir-Spl..	Gear..	Schebl..	1	Gra...	Wau....	Cent..	.....	.....	.....	.....	O-C...
Luedinghaus.....K	2–2½	145	36x4•	36x7•	Wau....	4-4½x5½	2	Met-Gear..	Bre.....	Fin...	Pump.	Cir-Spl..	Gear..	Schebl..	1¼	Gra...	Wau....	Cent..	.....	.....	.....	.....	.....
Maccar.....L2	1½	150	36x4	36x6	Cont....	4-4½x5½	4	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Muel....	Suc..	1350	19	Bosch..	Eis....	S&O...
Maccar.....HA	2	162	36x4	36x4d	Cont....	4-4½x5½	4	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Muel....	Suc..	1350	19	Bosch..	Eis....	S&O...
Maccar.....H2	3	162	36x4	36x4d	Cont....	4-4½x5½	2	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Muel....	Suc..	1300	20	Bosch..	Eis....	S&O...
Maccar.....MA	4	186	36x5	36x5d	Cont....	4-4½x6	2	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Muel....	Suc..	1150	16	Bosch..	Eis....	S&O...
Maccar.....G	5	186	36x5	40x6d	Cont....	4-4½x6	2	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Muel....	Suc..	1150	13	Bosch..	Eis....	S&O...
MacDonald.....A	7½	180	40x7	40x14	Buda....	4-4½x6	4	Met-Gear..	Mod....	PT...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Simp....	Cent..	1300	10	.....	.....	.....
Mack.....AB	1½	144	36x4	36x3½d	Own....	4-4x5	2	Met-Gear..	Own....	Cel...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Vac...	Own....	Cent..	1275	17	Lee-N..	Teagle..	S-P...
Mack.....AB	2	144	36x4	36x4d	Own....	4-4x5	2	Met-Gear..	Own....	Cel...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1275	17	Lee-N..	Teagle..	S-P...
Mack.....AB	2½	144	36x4	36x4d	Own....	4-4x5	2	Met-Gear..	Own....	Cel...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1275	19	Lee-N..	Teagle..	S-P...
Mack.....AC	3½	168	36x5	40x5d	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	14	Lee-N..	Teagle..	S-P...
Mack.....AC	5	168	36x6	40x6d	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	13	Lee-N..	Teagle..	S-P...
Mack.....AB Tractor	5	120	36x4	36x4d	Own....	4-4x5	2	Met-Gear..	Own....	Cel...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1275	12	Lee-N..	Teagle..	S-P...
Mack.....AC	6½	168	36x6	40x12	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	11	Lee-N..	Lee-N..	S-P...
Mack.....AC Tractor	7	119	36x5	40x5d	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	.....	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	11	Lee-N..	Teagle..	S-P...
Mack.....AC	7½	168	36x7	40x7d	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	10	Lee-N..	Lee-N..	S-P...
Mack.....AC Tractor	10	119	36x6	40x6d	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	10	Lee-N..	Teagle..	S-P...
Mack.....AC Tractor	13	119	36x6	40x12	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	9	Lee-N..	Lee-N..	S-P...
Mack.....AC Tractor	15	119	36x7	40x7d	Own....	4-5x6	2	Met-Gear..	Own....	PT...	Pump.	Cir-Spl..	Gear..	Schebl..	1½	Gra...	Own....	Cent..	1000	8	Lee-N..	Lee-N..	S-P...
Mapleleaf.....AA	2	144	36x4	36x7	Hink....	4-4x5½	4	Met-Gear..	McCo...	PT...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1200	18	West..	Eis....	S&C...
Mapleleaf.....BB	3	150	36x4	36x4d	Hink....	4-4½x5½	4	Met-Gear..	McCo...	PT...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1200	16	West..	Eis....	S&C...

For abbreviations, see pages 350 and 351.

Trucks (Continued)

CLUTCH		TRANSMISSION												SPRINGS		BRAKES		STEERING		WHEELS			
		GEARSET				UNIVERSAL JOINTS		AXLES															
Make	Type	Make	Type	Location	Forward Speeds	Make	Type	Front Make	Rear Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Final Drive Type	Front	Rear	Service	Emergency	Steering Gear Make	Steering Gear Type	Make	Type	Frame Material	Make and Model
B&B	Pla	Own	SG	Sep-Un	4	Pet	Met	Tim	Tim	6.40	RR	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Day	C-S	P-S	Hal-Fur D
B&B	Pla	Own	SG	Sep-Un	4	Pet	Met	Tim	Tim	8.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Day	C-S	P-S	Hal-Fur B
B&B	Pla	Own	SG	Sep-Un	4	Pet	Met	Tim	Tim	12.00	RR	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Day	C-S	P-S	Hal-Fur F
B-L	D-M	B-L	SG	Un-WE			Met	Tim	Tim	7.75	Sp	Sp	Worm	E	El	Int	Int	Gem	W&W	Smith	C-S	R-S	Hall 2½
B-L	D-M	B-L		Sep-Un	4	Spi	Met	Tim	Tim	10.33	Sp	Sp	Worm	E	E	Int	Int	Gem	W&S	Smith	C-S	R-S	Hall 3½
B-L	D-M	Ful	SG	Un-WE	3	Spi	Met	She	She	7.75	Sp	Sp	Worm	E	E	Int	Int	Gem	W&S	Smith	C-S	R-S	Hall 5
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	14.70	RR	TA	Ch	E	E	Int	Int	Gem	W&S	Smith	C-S	R-S	Hall 7 Chain
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	She	She	7.75	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	StM	Art	R-S	Harvey WOA
Ful	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	7.75	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	StM	Art	R-S	Harvey WFA
Ful	D-M	B-L	SG	Sep-Un		Spi	Met	She	She	8.75	Sp	Sp	Worm	E	E	Int	Int	Ross	S&N	StM	Art	R-S	Harvey WHA
Ful	D-M	Ful	SG	Un-WE		Hart	Met	Col	Clark	7.60	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	Hawkeye K
Ful	D-M	Ful	SG	Un-WE	4	Hart	Met	Col	Clark	8.00	Sp	Sp	I-G	E	E	ExtDr	IntR-W	Ross	S&N	Bimel	Art	R-S	Hawkeye M
Ful	D-M	Cotta	CM	Sep-Un	4	Hart	Met	Shu	Clark	10.00	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Ross	S&N	Clark	C-S	R-S	Hawkeye N
Ful	D-M				3			Tim	Tim				Worm	E	E			Ross				C-S	Hendrickson
Ful	D-M				4			Tim	Tim				Worm	E	E			Ross				C-S	Hendrickson
Ful	D-M				4			Tim	Tim				Worm	E	E			Ross				C-S	Hendrickson
Ful	D-M				4			Tim	Tim				Worm	E	E			Ross				C-S	Hendrickson
B&B	Pla	Cotta	CM	Un-WE	4	Un	Met	Col	Clark	7.00	RR	Sp	I-G	E	E	Ext	Int	Jac	S&N	A-W	Art	R-S	Huron Erie
B&B	Pla	Cotta	CM	Un-WE	4	Un	Met	Col	Clark	8.00	RR	Sp	I-G	E	E	Ext	Int	Jac	S&N	A-W	Art	R-S	Huron Mich.
B&B	Pla	B-L	SG	Sep-Un	3			She	She	7.80	RR	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Bimel	Art	R-S	Indiana 12
B&B	Pla	B-L	SG	Sep-Un	4			She	She	7.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Day	C-S	R-S	Indiana 20
B&B	Pla	B-L	SG		4			She	She	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Day	C-S	R-S	Indiana 25
B&B	Pla	B-L	SG	Sep-Un	4			She	She		RR	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Day	C-S	R-S	Indiana 35
B&B	Pla	B-L	SG	Sep-Un	4			She	She	10.25	RR	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Smith	C-S	R-S	Indiana 51
Mun	D-M	Mun	SG	Un-WE	3	Snead	Fab	Tor	Tor	6.30	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	CAS	W&W	Own	Art	P-S	International S
Own	D-M	Own	SG	Sep-Un	3	Own	Met	Own	Own	7.00	Sp	Sp	I-G	E	E	IntR-W	IntR-W	Own	W&W	Own	Art	P-S	International 21
Own	D-M	Own	SG	Sep-Un	3	Own	Met	Own	Own	8.00	Sp	Sp	I-G	E	E	IntR-W	IntR-W	Own	W&W	Own	Art	P-S	International 31
Own	D-M	B-L	SG	Sep-Un	4	Own	Met	Own	Own	9.00	Sp	Sp	I-G	E	E	IntR-W	IntR-W	Own	W&W	Own	Art	P-S	International 41
Own	D-M	B-L	SG	Sep-Un	4	Own	Met	Own	Own	9.00	Sp	Sp	I-G	E	E	IntR-W	IntR-W	Own	W&W	Own	Art	P-S	International 61
Own	D-M	B-L	SG	Sep-Un	4	Own	Met	Own	Own	11.00	Sp	Sp	I-G	E	E	IntR-W	IntR-W	Own	W&W	Own	Art	P-S	International 101
B-L	D-M	B-L	SG	Un-WE	3	Therm	Fab	Tim	Tim	7.75	RR	Sp	Worm	E	E	Int	Int	Gem	W&W	StM	Art	R-S	K-Z 1
B-L	D-M	B-L	SG	Un-WE	3	Snead	Fab	Tim	Tim	8.50	RR	Sp	Worm	E	E	Int	Int	Gem	W&W	StM	Art	R-S	K-Z 1½
B-L	D-M	B-L	SG	Sep-Un	4	Snead	Fab	Tim	Tim	9.25	RR	Sp	Worm	E	E	Int	Int	Gem	W&W	StM	Art	R-S	K-Z 2½
B-L	D-M	B-L	SG	Sep-Un	4	Snead	Fab	Tim	Tim	10.33	RR	Sp	Worm	E	E	Int	Int	Gem	W&W	StM	Art	R-S	K-Z 3½
B-L	D-M	B-L	SG	Sep-Un	4	Snead	Fab	Tim	Tim	12.33	RR	Sp	Worm	E	E	Int	Int	Gem	W&W	StM	Art	R-S	K-Z 6
Ful	D-M	Ful	SG	Sep-Un	4	Acme	Met	Shu	Wis	8.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&S	Bimel	Art	R-S	Kalamazoo G1
Ful	D-M	Ful	SG	Sep-Un	4	Acme	Met	She	She	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross		Smith	C-S	R-S	Kalamazoo H
Ful	D-M	Ful	SG	Sep-Un	4	Acme	Met	She	She	10.25	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&S	Smith	C-S	R-S	Kalamazoo K
Ful	D-M	Ful	SG	Sep-Un	4	Spi	Met	She	She	13.00	RR	Sp	Worm	E	E	IntR-W		Ross	W&S	Smith	C-S	R-S	Kalamazoo K5
B&B	Pla	G-L	SG	Un-WE		M&E	Met	Tor	Tor	6.50		Sp	I-G	E	E	Int	Ext	Lav	W&S	Wayne	Art	P-S	Kearns H
B&B	Pla	G-L	SG	Un-WE		M&E	Met	Tor	Tor	8.00	Sp	Sp	I-G	E	E	Int	Ext	Lav	W&S	Wayne	Art	P-S	Kearns N
	D-D		SG		3		Met	Own	She	8.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&S		Art	P-S	Kelly-Springfield K34
	D-D		SG		3		Met	Own	She	8.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&S		Art	P-S	Kelly-Springfield K38
			SG						Clark	10.00	RR		I-G	E	E	IntR-W	IntR-W		W&S		P-S	P-S	Kelly-Springfield K41
			SG					Own	Own	12.24	RR	Sp	Ch	E	E	IntR-W	IntR-W		W&S		Art	P-S	Kelly-Springfield K50
								Own	Own	12.24	RR	Sp	Ch	E	E	IntR-W	IntR-W		W&S		Art	P-S	Kelly-Springfield K60
Ful	D-M	Ful	SG	Un-WE		Spi	Met	Tor	Rus	8.80	Sp	Sp	I-G	E	E	Ext	IntR-W	Ross	S&N		Art	R-S	Keystone
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	6.50	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Smith	C-S	P-S	Kimball AB
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	7.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Smith	C-S	P-S	Kimball AK
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	8.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Smith	C-S	P-S	Kimball AE
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	8.75	Sp	Sp	Worm	E	E	Int-RW	IntR-W	Woh	S&N	Smith	C-S	P-S	Kimball AF
War	D-M	War	SG	Un-WE	3	Spi	Met	Own	Tim	5.06	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Jac	S&N	StM	Art	P-S	Kissel Express
War	D-M	War	SG	Un-WE	3	Spi	Met	She	She	7.80	Sp	Sp	Worm	E	E	IntR-W	IntR-W		S&N	Prud	Art	P-S	Kissel General Utility
War	D-M	War	SG	Sep-Un	4	Spi	Met	Tim	Tim	8.50	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Prud	Art	P-S	Kissel Freighter
War	D-M	War	SG	Sep-Un	4	Spi	Met	She	She	11.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Kissel Heavy Duty
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	7.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	SanF	Art	R-S	Kleiber
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	7.75	RR	Sp	Worm	E	E	Int-RW	IntR-W	Ross	S&N	Smith	C-S	R-S	Kleiber
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	8.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Kleiber
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	8.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Kleiber
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Kleiber
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	11.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Kleiber
Mec	D-M	Mec	SG	Un-WE	3	M&E	Met	Shu	Own	7.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Jones	Art	P-S	Koehler D
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Shu	Tim	9.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Wayne	Art	P-S	Koehler M
B-L	D-M	B-L	SG	Sep-Un		Spi	Met	Shu	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Day	C-S	P-S	Koehler F
B-L	D-M	B-L	SG	Sep-Un	4			Tim	Tim	9.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Hoop	Art	P-S	Lange EA
B-L	D-M	B-L	SG	Un-WE	3	Nor	Fab	Sal	Sal	5.75	Sp	Sp	S-B	E	E	ExtR-W	IntR-W	Gem	W&W	Indes	P-S	P-S	Larrabee K2
B-L	D-M	B-L	SG	Un-WE	3			She	She	7.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Hoop	Art	P-S	Larrabee J4
B-L	D-M	B-L	SG	Sep-Un	4			She	She	8.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Larrabee K4
B-L	D-M	B-L	SG	Sep-Un	4			She	She	10.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Larrabee L4
B-L	D-M	B-L	SG	Sep-Un	4			She	She	10.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Larrabee W
B-L	D-M	G-L	SG	Un-WE		Spi	Met	Col	Dun	6.20	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Bimel	Art	R-S	Luedinghaus C
B-L	D-M	DG&M	SG	Un-WE		Spi	Met	Shu	Wis	8.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N			P-S	Luedinghaus W
B-L	D-M	DG&M	SG	Un-WE		Spi	Met	Shu	Wis	8.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N			P-S	Luedinghaus K
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Day	C-S	P-S	Maccar L2
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	8.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Day	C-S	P-S	Maccar HA
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	7.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Day	C-S	P-S	Maccar H2
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Day	C-S	P-S	Maccar MA
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.25	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Day	C-S	P-S	Maccar G
B-L	D-M	B-L	SG	Un-WE	4	Own	Met	Own	Own	17.50		Sp		T		Ext	Ext	Own		Own	C-S		MacDonald A
Own	D-M	Own	SG	Un-WE		Spi	Met	Own	Own	7.60	Sp	Sp	B-S&ch	E	E	IntR-W	ExtDr	Own	W&W			P-S	Mack AB
Own	D-M	Own	SG	Un-WE	4	Spi	Met	Own	Own	7.60	Sp	Sp	B-S&ch	E	E	IntR-W	ExtDr	Own	W&W			P-S	Mack AB
Own	D-M	Own	SG	Un-WE	4	Spi	Met	Own	Own	6.99	RR		B-S&ch	E	E	ExtDr	IntR-W	Own	W&W			P-S	Mack AB
Own	Pla	Own	SG	Un-WJ	3	Spi	Met	Own	Own	8.49	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC
Own	Pla	Own	SG	Un-WJ	3	Spi	Met	Own	Own	9.00	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC
Own	D-M	Own	SG	Un-WE		Spi	Met	Own	Own	10.53	RR		Ch	E	E	ExtDr	IntR-W	Own	W&W			P-S	Mack AB Tractor
Own	Pla	Own	SG	Un-WJ		Spi	Met	Own	Own	10.50	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC
Own	Pla	Own	SG	Un-WE	3	Spi	Met	Own	Own	10.76	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC Tractor
Own	Pla	Own	SG	Un-WE	3	Spi	Met	Own	Own	11.58	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC
Own	Pla	Own	SG	Un-WJ	3	Spi	Met	Own	Own	11.58	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC Tractor
Own	Pla	Own	SG	Un-WJ		Spi	Met	Own	Own	12.92	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC Tractor
Own	Pla	Own	SG	Un-WJ	3	Spi	Met	Own	Own	14.10	RR		Ch	E	E	Ext	IntR-W	Own	W&W			P-S	Mack AC Tractor
Ful	D-M	Ful	SG	Un-WE	4	Blood	Met	She	She	8.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Dom	Art	R-S	Mapleleaf AA
Ful	D-M	Ful	SG	Un-WE	4	Blood	Met	She	She	8.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Dom	Art	R-S	Mapleleaf BB

For abbreviations, see pages 350 and 351.

Specifications of American

Make and Model	Tons Capacity	Wheel-Base, Ins.	TIRE SIZE Front, Ins.	TIRE SIZE Rear, Ins.	ENGINE Make	ENGINE Number Cylinders, Bore and Stroke	ENGINE Cylinders Cast	ENGINE Camshaft Drive Type	ENGINE Radiator Core Make	ENGINE Radiator Core Type	ENGINE Water Circulation	ENGINE OILING SYSTEM Type	ENGINE OILING SYSTEM Oil Pump Type	ENGINE FUEL SYSTEM Carburetor Make	ENGINE FUEL SYSTEM Carbureter Size, Ins.	ENGINE FUEL SYSTEM Fuel Feed	ENGINE GOVERNOR Make	ENGINE GOVERNOR Type	ENGINE SPEED Motor in R.P.M.	ENGINE SPEED Truck in M.P.H.	ELECTRICAL SYSTEM Generator Make	ELECTRICAL SYSTEM Ignition System, Make	ELECTRICAL SYSTEM Ignition System, Type
Mapleleaf.....CC	4	160	36x5	36x5d	Hink....	4-4½x5½	4	Met-Gear..	McCo...	PT...	Pump.	Hcl-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1200	12	West..	Eis....	S&C..
Mapleleaf.....DD	5	160	36x6	40x6d	Hink....	4-4½x5½	4	Met-Gear..	McCo...	PT...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1200	11	West..	Eis....	S&C..
Master.....JW	1½	142	34x3½	34x5	Buda...	4-4¼x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Pist..	Own....	1½	Vac...	McCan..	Suc...	1175	15	.....	.....	S-P...
Master.....D&W	2½	144	34x4	36x7	Buda...	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac...	McCan..	Suc...	1100	13	.....	.....	S-P...
Master.....A	3½	158	36x5	40x5d	Buda...	4-4½x6	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac...	Pier....	Cent..	1000	11	.....	.....	S-P...
Master.....E	3½	158	36x5	40x5d	Buda...	4-4½x6	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac...	Pier....	Cent..	1000	11	.....	.....	S-P...
Master.....B	5	170	36x6	40x6d	Buda...	4-4½x6½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac...	Pier....	Cent..	925	9	.....	.....	S-P...
Master.....F	5	170	36x6	40x6d	Buda...	4-4½x6½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac...	Pier....	Cent..	925	9	.....	.....	S-P...
Menominee.....HT	1	130	34x3½*	36x5*	Wis.....	4-3½x5	4	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1	Gra....	.....	.....	1350	18	Bosch..	Eis....	S-P...
Menominee.....H	1½	144	36x3½*	36x5*	Wis.....	4-4x5	4	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1	Gra....	.....	.....	1350	17	Bosch..	Eis....	.....
Menominee.....D	2	144	36x4	36x8	Wis.....	4-4x6	4	Met-Gear..	G&O....	Fin...	Pump.	.....	Gear..	Stromb..	1½	Gra....	.....	.....	1350	16	Bosch..	Eis....	S-P...
Menominee.....G	3½	160	36x5*	36x10*	Wis.....	4-4½x6	4	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Gra....	.....	.....	1250	12	Bosch..	Eis....	.....
Menominee.....J3	5	160	36x6	40x12	Wis.....	4-4½x6	2	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Gra....	.....	.....	1250	12	Bosch..	Eis....	.....
Moline.....10	1½	130	34x5p	36x6p	Own....	4-3½x5	4	Met-Gear..	Own....	Fin...	Ther..	Hol-Crk.	Gear..	Tillot...	1½	Gra....	Pharo...	Cent..	1800	24	Aut-L..	Splitd..	.....
Moreland.....22C	2½	168	36x4	36x8	Cont....	4-4½x5½	2	.....	.....	Fin...	.....	.....	.....	.....	.....	Gra....	.....	.....	.....	21	Splitd..	.....	.....
Moreland.....22H	3½	186	36x5	40x5d	Cont....	4-4½x6	2	.....	.....	Fin...	.....	.....	.....	.....	.....	Gra....	.....	.....	.....	23	Splitd..	.....	.....
Napoleon.....9	1	133	35x5p	35x5p	Gray-B..	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	.....	Gear..	.....	1	Gra....	.....	.....	1800	31	G&D..	G&D..	.....
Napoleon.....11	1½	133	35x5p	36x6p	Gray-B..	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	.....	Gear..	.....	1	Gra....	.....	.....	1800	25	G&D..	G&D..	.....
Nelson LeMoon.....G	1½	....	36x3½	36x6	Cont....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra....	Pharo...	.....	1100	20	West..	.....	.....
Nelson LeMoon.....G	2½	....	36x4	36x7	Cont....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra....	Pharo...	.....	1000	17	West..	Bosch..	.....
Nelson LeMoon.....G	3½	....	36x5	36x5d	Cont....	4-4½x5½	2	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra....	Pharo...	.....	1100	15	West..	.....	.....
Nelson LeMoon.....G	5	....	36x6	40x6d	Cont....	4-4½x6	2	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra....	.....	Cent..	1100	12	West..	.....	.....
Netco.....DK	2	144	36x4	36x8d	Cont....	4-4½x5½	2	Met-Gear..	E&M...	Fin...	Pump.	Cir-Spl..	Pist..	Zenith...	1½	Vac....	.....	.....	.....	20	.....	Eis....	D-P...
Netco.....HL	2½	168	36x4	36x8d	Cont....	4-4½x5½	2	Met-Gear..	E&M...	Fin...	Pump.	Cir-Spl..	Pist..	Zenith...	1½	Vac....	.....	.....	.....	20	West..	Eis....	D-P...
Niles.....E	2	150	36x4*	36x7*	Cont....	4-4½x5½	4	Met-Gear..	Mod....	Cel...	Pump.	Cir-Spl..	Pist..	Stromb..	1½	Gra....	Mon....	Cent..	.....	.....	.....	Eis....	.....
Noble.....B30	1½	156	36x3½	36x5	Buda...	4-3½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Vac....	Pier....	Cent..	1200	15	West..	Eis....	S-P...
Noble.....C40	2	160	36x4	36x7	Buda...	4-4x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1¼	Vac....	Pier....	Cent..	1075	15	West..	Eis....	S-P...
Noble.....D50	2½	162	36x4	36x8	Buda...	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Pier....	Cent..	1080	15	West..	Eis....	S-P...
Noble.....E70	3½	182	36x5	36x10	Buda...	4-4½x6	4	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Pier....	Cent..	972	12	West..	Eis....	S-P...
Northway.....B2	2	161	36x4*	36x4d*	Own....	4-4x6	4	.....	G&O....	.....	Pump.	.....	.....	Stromb..	.....	Vac....	Pier....	Cent..	.....	.....	Bijur..	Wagnr..	.....
Northway.....B3	3½	160	36x5	40x5d	Own....	4-4x6	4	.....	G&O....	.....	Pump.	.....	.....	Stromb..	.....	Vac....	Pier....	Cent..	1350	16	Bijur..	Wagnr..	.....
Norwalk.....25E	1	130	34x3½*	34x4d*	Lyc.....	4-3½x5	4	Met-Gear..	Stan....	Cel...	Ther..	Cir-Spl..	Pist..	Zenith...	1	Vac....	.....	.....	2200	30	Dyn..	Delco..	O-C...
Norwalk.....35E	1½	143	34x3½*	34x5d*	Lyc.....	4-3½x5	4	Met-Gear..	Stan....	Cel...	Ther..	Cir-Spl..	Pist..	Zenith...	1	Vac....	.....	.....	2200	25	Dyn..	Delco..	.....
Norwalk....35E Special	2	143	34x3½*	34x6d	Buda...	4-3½x5½	4	Met-Gear..	Stan....	Cel...	Pump.	Cir-Spl..	Pist..	Zenith...	1	Vac....	.....	.....	1600	20	Dyn..	Delco..	O-C...
Ogden.....A2	¾	125	34x5p	34x5p	Cont....	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Vac....	.....	.....	.....	.....	.....	.....	.....
Ogden.....D	1½	131	36x3½	36x5	Cont....	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Gra....	Pier....	Cent..	.....	.....	Vesta..	Splitd..	O-C...
Ogden.....E	2½	150	36x4	36x8	Cont....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Pist..	Stromb..	1½	Gra....	Pier....	Cent..	.....	.....	Vesta..	.....	O-C...
Ogden.....F	3½	175	36x5	40x10	Cont....	4-4½x5½	2	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra....	Pier....	Cent..	.....	.....	.....	.....	O-C...
Ogden.....G	5	168	36x6	40x12	Cont....	4-4½x6	2	Met-Gear..	Chic....	Fin...	Pump.	Hol-Crk.	.....	Stromp..	1½	Gra....	Cont....	Cent..	900	11	.....	.....	O-C...
Old Hickory.....W	1	135	36x3½p	36x4p	Cont....	4-3½x5	4	.....	Long....	Fin...	Ther..	Cir-Spl..	.....	Stromb..	.....	Vac....	Pier....	Cent..	1200	18	.....	Eis....	.....
Old Reliable.....A	1½	150	34x4	36x6	Wis.....	4-4x5	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac....	Mon....	Suc...	1600	15	Vesta..	Bosch..	S&O..
Old Reliable.....B	2½	160	34x4	36x8	Wis.....	4-4½x6	4	Met-Gear..	Chic....	Fin...	Pump.	.....	Gear..	Stromb..	1½	Vac....	Mon....	Suc...	1600	15	Vesta..	Bosch..	S&O..
Old Reliable.....C	3½	168	36x5	36x10d	Wis.....	4-4½x6	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac....	Mon....	Suc...	1600	15	Vesta..	Bosch..	S&O..
Old Reliable.....D	5	186	36x6	40x12	Wis.....	4-4½x6	2	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac....	Mon....	Suc...	1600	15	Vesta..	Bosch..	S&O..
Old Reliable.....K&L	7	136	36x6	40x14	Wau.....	4-5x6½	2	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Ecc...	Stromb..	1½	Gra....	Wau....	Cent..	1400	11	.....	Bosch..	S&O..
Olympic.....	2½	156	36x4*	36x8*	Buda...	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	.....	Gear..	Zenith...	1½	Gra....	Opt....	Cent..	.....	.....	.....	.....	.....
Oneida.....B	1½	144	36x6*	38x7*	Hink....	4-4x5½	4	Met-Gear..	Mod....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Vac....	Hink....	Cent..	1600	25	West..	Bosch..	.....
Oneida.....C	2½	160	38x7*	40x8*	Hink....	4-4x5½	4	Met-Gear..	Mod....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Vac....	Hink....	Cent..	1600	22	West..	Bosch..	.....
Oneida.....D	3½	170	36x5	36x10	Hink....	4-4½x5½	4	Met-Gear..	Mod....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Hink....	Cent..	1450	18	West..	Bosch..	.....
Oneida.....E	5	180	36x6	40x12	Hink....	4-4½x5½	4	Met-Gear..	Mod....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Hink ..	Cent..	1400	11	West..	.....	.....
Oshkosh.....A	2	136	36x6p	36x6p	H-S.....	4-3½x5	4	Met-Gear..	Bre....	Fin...	Ther..	Cir-Spl..	Gear..	Zenith...	1½	Vac....	.....	Cent..	1600	21	NE....	NE....	O-C...
Oshkosh.....B	2½	146	38x7p	38x7p	Her.....	4-4x5½	4	Met-Gear..	Bre....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	.....	Cent..	1500	21	NE....	NE....	O-C...
Packard.....EC	2	144	36x6	40x8	Own....	4-4¾x5½	4	Met-Gear..	Fed.....	Fin...	Pump.	Cir-Spl..	Gear..	Own....	1⅜	Pr....	Own....	Cent..	1800	27	Bijur..	Dixie..	S-P...
Packard.....ED	3	156	36x5	36x5d	Own....	4-4½x5½	4	Met-Gear..	Fed.....	Fin...	Pump.	Cir-Spl..	Gear..	Own....	1⅜	Pr....	Own....	Cent..	1075	12	Bijur..	Dixie..	S-P...
Packard.....EF	5	156	36x6	40x6d	Own....	4-5x5½	4	Met-Gear..	Fed.....	Fin...	Pump.	Cir-Spl..	Gear..	Own....	1⅜	Pr....	Own....	Cent..	1075	11	Bijur..	Dixie..	S-P...
Paige.....52-19	1½	140	34x3½	34x5	Hink....	4-4x5½	4	Met-Gear	Natl....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Hink....	Cent..	1550	20	Remy..	Bosch..	S-P...
Paige.....54-20	2½	150	34x4	34x8	Hink....	4-4½x5½	4	Met-Gear..	Natl....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Simp....	Cent..	1500	17	Remy..	Bosch..	S-P...
Paige.....51-18	3½	160	36x5	36x5d	Hink....	4-4½x5½	4	Met-Gear..	Natl....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Simp....	Cent..	1450	15	Remy..	Bosch..	S-P...
Parker.....G1	2½	150	34x4	36x8	Wis.....	4-4½x6	4	Met-Gear..	Bre....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Pier....	Cent..	1050	15	West..	Eis....	S&O..
Parker.....J20	3½	160	36x5	40x10	Wis.....	4-4½x6	4	Met-Gear..	Bre....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Pier....	Cent..	1050	14	West..	Eis....	S&O..
Parker.....M20	5	160	36x6	40x12	Wis.....	4-5x6	2	Met-Gear..	Bre....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	Pier....	Cent..	1050	12	West..	Eis....	S&O..
Patriot.....Revere	1	128	35x5p	35x5p	Cont....	4-3½x5	4	Met-Gear..	B&W...	PT...	Ther..	Cir-Spl..	Pist..	Stromb..	1¼	Vac....	.....	.....	.....	.....	Bijur..	At-K....	.....
Patriot.....Lincoln	2	140	34x3½*	34x5*	Hink....	4-4x5½	4	Met-Gear..	B&W...	PT...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Vac....	.....	.....	.....	.....	.....	.....	.....
Patriot.....Washington	3	156	36x4*	36x7*	Hink....	4-4½x4½	4	Met-Gear..	B&W...	PT...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac....	.....	.....	.....	.....	.....	.....	.....
Pierce-Arrow.....X5	2	150	36x4	36x4d	Own....	4-4x5½	4	Met-Gear..	Rome T.	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Pr....	Own....	Cent..	1600	18	Delco..	Delco..	C-D...
Pierce-Arrow.....W2	3½	162	36x5	36x5d	Own....	4-4½x5½	4	Met-Gear..	Rome T.	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Pr....	Own....	Cent..	1200	16	Delco..	Delco..	C-D...
Pierce-Arrow.....R10	5	168	36x5	40x6d	Own....	4-4½x6½	4	Met-Gear..	Rome T.	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Pr....	Own....	Cent..	1200	14	Delco..	Delco..	C-D...
Pioneer.....59AA	1	130	32x4½p	32x4½p	GB&S..	4-3½x4½	4	N-M-G...	Own....	Cel...	Ther..	Cir-Spl..	Ecc...	Zenith...	1½	.....	.....	.....	2400	40	Aut-L..	Bosch..	D-P...
Pittsburgher.....B	2½	160	36x5*	36x7*	Cont....	4-4½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	Cir-Spl..	Pist..	Stromb..	1½	Vac....	Mon....	Suc...	1600	18	Opt....	.....	.....
Pittsburgher.....C21	3	162	36x5*	36x7*	Mid.....	4-4½x5½	4	Met-Gear..	G&O....	Fin...	Pump.	Pre.....	Gear..	Stromb..	1½	Vac....	Mon....	Suc...	1400	16	Opt....	.....	.....
Power.....F	2	140	36x6*	40x8*	Hink....	4-4½x5	2	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra....	Hink....	Cent..	1600	22	West..	Eis....	.....
Power.....C	3½	160	36x5c	40x10c	Hink....	4-4½x5½	2	Met-Gear..	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Vac....	Hink....	Cent..	1600	14	West..	Eis....	.....
Rainier.....R21	¾	125	35x5p	35x5p	Cont....	4-3½x5	4	Met-Gear.	Har.....	Cel...	Ther..	Cir-Spl.	.....	Zenith..	1	Vac..	Mon....	Suc....	.....	.....	.....	.....	.....
Rainier.....R19	1	133	34x3½	34x4 d,e	Cont....	4-3½x5	4	Met-Gear.	Har.....	Cel...	Ther..	.....	.....	Zenith..	1	Vac..	Mon....	Suc....	1400	20	.....	.....	.....
Rainier.....R18	2	147	34x4	34x6	Cont....	4-4½x5½	4	.....	E&M...	Fin...	Pump.	Cir-Spl..	Pist..	Zenith..	1	Vac..	Pier....	Cent....	.....	16	.....	.....	.....
Rainier.....R16	1½	147	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear.	Har.....	Cel...	Ther..	Cir-Spl.	.....	Zenith..	1	Vac..	Mon....	Suc....	.....	18	.....	.....	.....
Rainier.....R20	2½	165	34x4	34x7	Cont....	4-4½x5½	4	.....	.....	Fin...	Pump.	Hol-Crk.	.....	Zenith..	1½	Vac..	Pier....	Cent....	.....	16	.....	.....	.....
Rainier.....R15	3½	170	36x5	36x5d	Cont....	4-4½x5½	2	.....	E&M...	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Vac..	Pier....	Cent..	1200	15	.....	Eis....	.....
Rainier.....R17	5	172	36x6	40x6d	Cont....	4-4½x6	2	.....	E&M...	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Vac..	Pier....	Cent....	.....	15	.....	Eis....	.....
Reo.....F	½–1½	128	34x4½p	34x4½p	Own....	4-4½x4½	2	Met-Gear..	Own....	Fin...	Pump.	Cir-Spl..	Pist..	Johsn...	1	Gra....	.....	.....	.....	.....	Remy..	.....	.....
Republic.....75	¾	124	32x4½p	32x4½p	Lyc.....	4-3½x5	4	Met-Gear.	G&O....	Cel...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Vac....	.....	.....	1900	35	Aut-L..	Aut-L..	S&C...
Republic.....10	1	124	34x3	34x4	Cont....	4-3½x5	4	Met-Gear.	G&O....	Cel...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Gra....	Own....	Suc....	1150	17	.....	Bosch..	S&C...
Republic.....10E	1	124	34x5p	34x5p	Cont....	4-3½x5	4	Met-Gear.	G&O....	Cel...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Gra....	.....	.....	1510	25	Delco..	Bosch..	S&C...
Republic.....11X	1½	144	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear.	G&O....	Cel...	Ther..	Cir-Spl..	Pist..	Stromb..	1	Gra....	Own....	Suc....	1200	15	.....	.....	S&C...
Republic.....19	2½	144	36x4	36x7	Cont....	4-4½x5½	4	Met-Gear.	G&O....	Cel...	Pump.	Cir-Spl..	Pist..	Stromb..	1½	Gra....	Pharo...	Hyd..	894	12	.....	.....	S&C...
Republic.....19W	2½	154	36x4	36x7	Wau.....	4-4x5½	2	Met-Gear.	G&O....	Cel...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Gra....	Wau....	Cent..	980	12	.....	.....	S&C...
Republic.....20	3½	165	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear.	G&O....	Fin...	Pump.	Cir-Spl..	Pist..	Stromb..	1½	Gra....	Pharo...	Hyd..	966	12	.....	.....	S&C...
Rowe.....HSW	¾	122½	34x5p	34x5p	Wis.....	4-3½x5	4	Met-Gear.	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra....	Simp....	Cent..	1500	30	Eis....	Eis....	S&C...
Rowe.....CW	1½	133	36x6p	36x6p	Wis.....	4-3½x5	4	Met-Gear.	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra....	Simp....	Cent..	1500	26	Eis....	Eis....	S&C...
Rowe.....CDW	2	140	34x4	36x3½d	Wis.....	4-4x5	4	Met-Gear.	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra....	Simp....	Cent..	1500	20	.....	Bosch..	S&C...
Rowe.....GSW	3	158	34x5	36x5d	Wis.....	4-4x6	4	Met-Gear.	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra....	Simp....	Cent..	1400	19	Eis....	Bosch..	S&C...
Rowe.....HW	4	158	36x5	36x6d	Wis.....	4-4½x6	4	Met-Gear.	Fed.....	Cel...	Pump.	Hcl-Crk.	Gear..	Zenith...	1½	Gra....	Simp....	Cent..	1400	17	Eis....	Bosch..	S&C...

For abbreviations, see pages 350 and 351.

Trucks (Continued)

CLUTCH		TRANSMISSION												SPRINGS		BRAKES		STEERING		WHEELS			
		GEARSET				UNIVERSAL JOINTS		AXLES															
Make	Type	Make	Type	Location	Forward Speeds	Make	Type	Front Make	Rear Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Final Drive Type	Front	Rear	Service	Emergency	Steering Gear Make	Steering Gear Type	Make	Type	Frame Material	Make and Model
Ful	D-M	Ful	SG	Un-WE	4	Blood	Met	She	She	10.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Dom	Art	R-S	Mapleleaf CC
Ful	D-M	Ful	SG	Sep-Un	4	Blood	Met	She	She	13.00	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Mapleleaf DD
Own	D-M	Own	SG	Un-WE	3	Spi	Met	Shu	Tim	7.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Prud	Art	P-S	Master JW
Ful	D-M	Ful	SG	Un-WE	4	Spi	Met	Tim	Tim	8.50	Sp	Sp	I-G&W	E	E	IntD-R	IntR-W	Ross	S&N		C-S	P-S	Master D&W
B-L	D-M	B-L	SG	Sep-Un	4		Met	Tim	Tim	10.50	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Master A
B-L	D-M	B-L	SG	Sep-Un	4		Met	Tim	Wal	10.41	RR	Sp	I-G	E	E	IntDr	IntR-W	Ross	S&N		C-S	P-S	Master E
B-L	D-M	B-L	SG	Sep-Un	4		Met	Tim	Tim	11.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Master B
B-L	D-M	B-L	SG	Sep-Un	4		Met	Tim	Wal	11.53	Sp	Sp	I-G	E	E	IntDr	IntR-W	Ross	S&N		C-S	P-S	Master F
Det	D-M	Cotta	CM	Un-WE	3	Spi	Met	Shu	Wis	7.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N		Art	R-S	Menominee HT
Det	D-M	Cotta	CM	Un-WE	3	Spi	Met	Shu	Wis	8.25	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N		Art	R-S	Menominee H
Det	D-M	Cotta	CM	Un-WE		Spi	Met	Cont	Wis	8.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N		Art	R-S	Menominee D
Det	D-M	Cotta	CM	Sep-Un	4	Spi	Met	Cont	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Menominee G
Det	D-M	Cotta	CM	Sep-Un	4	Spi	Met	Cont	Tim	11.66	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Menominee JS
B&B	Pla	Own	SG	Un-WE		Arvac	Met	Col	Tor	8.00	Sp	Sp	I-G	El	El	Ext	IntR-W	Ross	S&N	MWCo	Art	P-S	Moline 10
Own	D-M	Own		Sep-Un	4	Own	Fab	Tim	Tim		RR	Sp	Worm			IntR-W	IntR-W	Ross		Smith	C-S	P-S	Moreland 22
Own	D-M	Own		Sep-Un	4	Own	Fab	Tim	Tim		RR	RR	Worm			IntR-W	IntR-W	Ross		Smith	C-S	P-S	Moreland 22H
Ful	D-M	Ful	SG	Un-WE	3	Blood	Met	Tor		6.00		Sp	I-G	E	E	Ext	ExtDr	Lav	S&N	Roy	Art	R-S	Napoleon 9
Ful	D-M	Ful	SG	Un-WE	3	Blood	Met	Tor	Mid	7.50			I-G	E	E	Ext	ExtDr	Lav	S&N	Roy	Art	R-S	Napoleon 11
B-L	D-M	B-L	SG	Un-WE	3	Own	Fab	Tim	Tim		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Prud	Art	R-S	Nelson LeMoon G
B-L	D-M	B-L	SG	Un-WE	3	Own	Fab	Tim	Tim	7.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav					Nelson LeMoon G
B-L	D-M	B-L	SG	Un-WE	4	Own	Fab	Tim	Tim		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Prud	Art	R-S	Nelson LeMoon G
B-L	D-M	B-L	SG	Sep-Un	4	Own	Fab	Tim	Tim		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Prud	Art	R-S	Nelson LeMoon G
B-L	D-M	B-L	SG	Sep-Un		East	Met	Tim	Tim		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&S	Arch	Art	P-S	Netco DK
B-L	D-M	B-L	SG	Sep-Un		East	Met	Tim	Tim	7.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&S	Arch	Art	P-S	Netco HL
B-B	Pla	Cov	SG	Sep-Un	3	Blood	Met	Tim	Tim		RR		Worm	E	E	IntR-W	IntR-W	Gem	W&W		Art	P-S	Niles E
Ful	D-M	Ful	SG	Un-WE		M&E	Met	She	She	8.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	W&S	Bimel	Art	P-S	Noble B30
Ful	D-M	Ful	SG	Un-WE	3	M&E	Met	She	She	8.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	W&S	Bimel	Art	P-S	Noble C40
Ful	D-M	Ful	SG	Sep-Un	4	M&E	Met	She	She	8.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	W&S	Bimel	Art	P-S	Noble D50
Ful	D-M	War	SG	Sep-Un	4	M&E	Met	She	She	8.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	W&S	Bimel	Art	P-S	Noble E70
Ful	D-M	Ful	SG	Un-WE	4	Spi	Met	She	She		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross		Clark	C-S	P-S	Northway B2
Ful	D-M	Ful	SG	Un-WE	4	Spi	Met	She	She		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross		Clark	C-S	P-S	Northway B3
B-B	Pla	G-L	SG	Un-WE	3	UMCo	Met	Sal	Chic	7.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	CAS	W&W	E&O	Art	P-S	Norwalk 25E
B-B	Pla	G-L	SG	Un-WE	3	BCo	Met	She	She	8.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	CAS	W&W	E&O	Art	P-S	Norwalk 35E
B-B	Pla	G-L	SG	Un-WE		BCo	Met	She	She	7.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Dit	W&W	E&O	Art	P-S	Norwalk 35E Special
B-L	D-M	B-L	SG	Un-WE	3	M&E	Met	Tim	Tim	6.20	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Stan	Art	P-S	Ogden A2
B-L	D-M	B-L	SG	Un-WE	3	M&E	Met	Tim	Tim	8.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Stan	Art	P-S	Ogden D
B-L	D-M	B-L	SG	Sep-Un	4	M&E	Met	She	She	8.50	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Stan	Art	P-S	Ogden E
B-L	D-M	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Stan	Art	P-S	Ogden F
B-L	D-M	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Stan	Art	P-S	Ogden G
B-B	Pla	G-L	SG	Un-WE	3	Blood	Met	Tim	Tim		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav		Stan	Art	R-S	Old Hickory W
Ful	D-M	Ful	SG	Un-WE			Met	She	She	7.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	StM	Art	R-S	Old Reliable A
Ful	D-M	Ful	SG	Sep-Un	4	Spi	Met	She	She	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	StM	Art	R-S	Old Reliable B
Ful	D-M	Ful	SG	Sep-Un		Spi	Met	She	She	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	StM	Art	R-S	Old Reliable C
Uni	D-O	B-L	SG	Sep-Un	4	Spi	Met	She	She	10.25	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	StM	Art	R-S	Old Reliable D
Uni	D-O	Own	SG	Un-WJ	4		Met	Cont	Own	10.36	RR	Sp	Ch	E	E	ExtDr	IntR-W	Ross	S&N	StM	Art	R-S	Old Reliable K&L
B-L	D-M			Un-WE			M&F	Tim	Tim	7.75	RR		Worm	E	E	IntR-W	IntR-W	Ross	S&N	StM	Art	P-S	Olympic
Ful	D-M	Ful	SG	Sep-Un	3			Shu	Wis	7.75	RR	Sp	Worm	E	El	IntR-W	IntR-W	Ross	S&N	StM	Art	P-S	Oneida B
Ful	D-M	Ful	SG	Sep-Un	4	Pet	M&F	Shu	Wis	8.66	RR	Sp	Worm	El	El	IntR-W	IntR-W	Ross	S&N	StM	Art	P-S	Oneida C
Ful	D-M	Ful	SG	Sep-Un	4		M&F	Tim	Tim	10.66	RR	Sp	Worm	El	El	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Oneida D
Ful	D-M	Ful	SG	Sep-Un	4		M&F	Tim	Tim	11.66	RR	Sp	Worm	El	El	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Oneida E
B-L	D-M	B-L		Un-WE	4	Pet	Met	Own	Own	8.25	Sp	Sp	StB	E	E	ExtDr	R-W	Ross	S&N	Roy	Art	P-S	Oshkosh A
B-L	D-M	B-L	SG			Pet	Met	Own	Own	8.00	Sp	Sp	StB	E	E	ExtR-W	R-W	Ross	S&N	Roy	Art	P-S	Oshkosh B
Own	D-M	Own	SG	Un-WE	4		M&F	Own	Own	8.00	RR	TA	Worm	E	E	ExtDr	IntR-W	Own	W&W	Own		R-S	Packard EC
Own	D-M	Own	SG	Un-WE	4		M&F	Own	Own	9.00	RR	TA	Worm	E	E	ExtDr	ExtR-W	Own	W&W	Own		R-S	Packard ED
Own	D-M	Own	SG	Un-WE	4		M&F	Own	Own	10.66	RR	TA	Worm	E	E	ExtDr	R-W	Ross	S&N	Own		R-S	Packard EF
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	7.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Paige 52-19
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Day	C-S	P-S	Paige 54-20
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.33	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Own		P-S	Paige 51-18
B-L	D-M	Ful	SG	Sep-Un	4	Blood	Met	Shu	Own	7.75	RR	Sp	Worm	E	E	ExtDr	IntR-W	Ross	S&N	Bimel	Art	P-S	Parker G1
B-L	D-M	War	SG	Sep-Un	4	Blood	Met	Shu	Own	8.75	RR	Sp	Worm	E	E	ExtDr	IntR-W	Ross	S&N	Smith	C-S	P-S	Parker J20
B-L	D-M	War	SG	Sep-Un	4	Blood	Met	Shu	Own	10.25	RR	Sp	Worm	E	E	ExtDr	IntR-W	Ross	S&N	Smith	C-S	P-S	Parker M20
B-B	Pla	Cov	SG	Sep-Un	3		Fab	Flint	Emp	6.20	Sp	Sp	Worm	E	E	IntR-W	IntR-W	CAS	W&S	Bimel	Art	P-S	Patriot Revere
Cov	D-M	Ful	SG	Sep-Un	4		Fab	Shu	Emp	7.25	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&S	Bimel	Art	P-S	Patriot Lincoln
Cov	D-M	Cov	SG	Sep-Un	4		Fab	Shu	Wis	9.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&S	Bimel	Art	P-S	Patriot Washington
Cov	D-M	Cov	SG	Sep-Un	4	Spi	M&F	Eat	Eat		Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Day	C-S	P-S	Pierce-Arrow X5
Cov	D-M	Own	SG	Sep-Un	4	Spi	M&F	Own	Own		RR	TA	Worm	E	E	ExtDr	IntR-W	Ross	S&N	Day	C-S	P-S	Pierce-Arrow W2
Cov	D-M	Own	SG	Sep-Un	4	Spi	M&F	Own	Own	10.00	RR	TA	Worm	E	E	ExtDr	IntR-W	Ross	S&N	Day	C-S	P-S	Pierce-Arrow H10
DG&M	Pla	G-L	SG	Un-WE	3	Own	Fab	Cont	I-M	6.00	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Woh	S&N	Bimel	Art	P-S	Pioneer 59AA
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&W	Smith	C-S	P-S	Pittsburgher B
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Vul	Vul	9.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	W&W	Smith	C-S	P-S	Pittsburgher C21
Ful	D-M	Ful	SG	Un-WE	4	Arvac	Met	Vul	Vul	7.75	Sp	Sp	Worm	E	E	R-W	R-W	Ross	S&N	StM	Art	R-S	Power F
Ful	D-M	Ful	SG	Sep-Un	4	Arvac	Met	Cont	Wis	10.00	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	StM	Art	R-S	Power C
B-L	D-M	B-L	SG	Un-WE	3	Hart	Met	Tim	Tim	6.75	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Jones	Art	P-S	Rainier R21
B-L	D-M	B-L	SG	Un-WE	3	Hart	Met	She	She	7.80	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Jones	Art	P-S	Rainier R19
B-L	D-M	B-L	SG	Un-WE		Spi	Met	She	She	8.66	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Jones	Art	P-S	Rainier R18
B-L	D-M	B-L	SG	Un-WE		Hart	Met	She	She	7.80	Sp	Sp	Worm	E	E	IntR-W	IntR-W	Lav	S&N	Jones	Art	P-S	Rainier R16
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	8.50	RR		Worm	E	E	IntR-W	IntR-W	Ross	S&N	Jones	Art	P-S	Rainier R20
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.33	RR		Worm	E	E	IntR-W	IntR-W	Ross	S&N	Jones	Art	P-S	Rainier R15
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	13.66	RR		Worm	E	E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Rainier R17
Own	D-M	Own	SG	Sep-Un	3	Own	Met	Own	Own	4.70	Sp	TA	S-B	E	E	Ext	IntR-W	Own	P&S	Prud	Art	P-S	Ree F
Own	D-M	Own	SG	Un-WE	3	Spi	Met	Tor	Tor	5.38	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Jac	S&N	MWCo	Art	P-S	Republic 7S
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	Tor	Tor	6.28	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Jac	S&N		Art	P-S	Republic 10
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	Tor	Tor	6.28	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Jac	S&N		Art	P-S	Republic 10E
Ful	D-M	Ful	SG	Un-WE	3	Hart	Met	Tor	Tor	8.00	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Jac	S&N	MWCo	Art	P-S	Republic 11X
Ful	D-M	Ful	SG	Un-WE		Spi	Met	Tor	Tor	8.00	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Jac	S&N	MWCo	Art	P-S	Republic 19
Ful	D-M	Ful	SG	Un-WE		Pet	Met	Tor	Tor	8.00	Sp	Sp	I-G	E	E	ExtR-W	IntR-W	Jac	S&N	MWCo	Art	P-S	Republic 19W
Ful	D-M	Ful	SG	Un-WE		Spi	Met	Sav	Tor	10.26	Sp	Sp	I-G	E	E	ExtR-W	ExtDr	Jac	S&N	Smith	Art	P-S	Republic 20
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	She	She	5.00	RR	Sp	Worm	E	E	IntR-W	IntR-W	Gem	W&W	Hoop	Art	R-S	Rowe HSW
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	6.50	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Hoop	Art	R-S	Rowe CW
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	7.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Hoop	Art	R-S	Rowe CDW
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	7.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Hoop	Art	R-S	Rowe GSW
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	8.75	RR	Sp	Worm	E	E	IntR-W	IntR-W	Ross	S&N	Hoop	Art	R-S	Rowe HW

For abbreviations, see pages 350 and 351.

Specifications of American

Make and Model	Tons Capacity	Wheel-Base, Ins.	TIRE SIZE		ENGINE																ELECTRICAL SYSTEM		
												OILING SYSTEM		FUEL SYSTEM			GOVERNOR		SPEED				
			Front, Ins.	Rear, Ins.	Make	Number Cylinders, Bore and Stroke	Cylinders Cast	Camshaft Drive Type	Radiator Core Make	Radiator Core Type	Water Circulation	Type	Oil Pump Type	Carbureter Make	Carbureter Size, Ins.	Fuel Feed	Make	Type	Motor in R.P.M.	Truck in M.P.H.	Generator Make	Ignition System, Make	Ignition System, Type
Rowe.....FW	5	170	36x6	40x6d	Wis....	4-4½x6	4	Met-Gear..	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra...	Simp....	Cent..	1300	17	Eis....	Bosch..	S&C..
Ruggles.....	1	124	34x5	34x5	Cont....	4-4x5	...	.....	.....	Cel...	Pump.	Cir-Spl.	.....	Stromb..	....	.....	.....	.....	.....	.....	.....	.....	.....
Ruggles.....	2	...	34x7	34x7*	Own.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rumely.....A	1½	144	36x3½	36x5	Buda...	4-3½x5½	4	Met-Gear..	Mod....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Gra...	Pier.....	Cent..	1090	15	G&D...	Berlg..	.....
Samson.....15	¾	118	32x4p	32x4p	Own....	4-3½x4	4	Met-Gear..	MPCo..	PT...	Pump.	Cir-Spl..	Gear..	Zenith...	1	Gra...	Mon....	Suc...	1670	25	Aut-L..	Remy..	O&S..
Samson.....25	1½	118	35x5p	35x5p	Own....	4-3½x5¼	4	Met-Gear..	MPCo..	PT...	Pump.	Cir-Spl..	Gear..	Zenith...	1	Gra...	Mon....	Suc...	1312	20	Aut-L..	Remy..	O&S..
Sandow.....G	1	120	34x3½*	34x5*	Cont....	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	Cir-Spl..	Ecc...	Stromb..	1	Gra...	.....	.....	1400	25	Bosch..	Bosch..	D-P...
Sandow.....CG	1½	135	34x4*	35x5*	Cont....	4-3½x5	4	Met-Gear..	Chic....	Fin...	Ther..	Cir-Spl..	Ecc...	Stromb..	1	Gra...	.....	.....	1400	22	Bosch..	Bosch..	D-P...
Sandow.....J	2½	165	36x4*	36x7*	Cont....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	1½	Gra...	Mon....	Suc...	1100	15	Bosch..	Bosch..	D-P...
Sandow.....N	3½	175	36x5	36x5d	Cont....	4-4½x5½	4	.....	Chic....	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	1½	Gra...	Mon....	Suc...	1200	14	.....	.....	D-P...
Sandow.....L	5	175	36x6	36x6d	Cont....	4-4½x5½	4	Met-Gear..	Chic....	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	1½	Gra...	Mon....	Suc...	1100	12	.....	.....	D-P...
Sandford.....25	2½	174	36x4	36x4d	Cont....	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	2	Gra...	Pier.....	Cent.	1000	15	.....	Eis.....	.....
Sandford.....W35	3½	174	36x5	36x5d	Cont....	4-4½x5½	2	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	2	Gra...	Pier.....	Cent.	1000	13	.....	Eis.....	.....
Sandford.....W50	5	174	36x5	36x6d	Cont....	4-4½x5½	2	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	2	Gra...	Pier.....	Cent.	1000	11	.....	Eis.....	.....
Schacht.....F	2	156	36x4	36x7	Buda...	4-4½x5½	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Schebl..	1½	Gra...	Dup....	Cent.	1000	15	West..	Bosch..	S-P...
Schacht.....F	3	156	36x5	36x5d	Buda...	4-4½x5½	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Schebl..	1½	Gra...	Dup....	Cent.	1000	15	West..	Bosch..	S-P...
Schacht.....E	4	168	36x5	40x6d	Buda...	4-4½x6	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Schebl..	1½	Gra...	Dup....	Cent.	1000	20	West..	Bosch..	S-P...
Schacht.....E	5	168	36x6	40x12	Buda...	4-4½x6	4	Met-Gear..	Bre.....	Fin...	Pump.	Hol-Crk.	Gear..	Schebl..	1½	Gra...	Dup....	Cent.	1000	15	West..	Bosch..	S-P...
Schwartz.....A	1¼	130	34x4½p	34x4½p	Lyc.....	4-3½x5	4	Met-Gear..	G&O....	Cel...	Ther..	Cir-Spl..	.....	Carter..	1	Vac.....	.....	.....	1800	30	West..	West..	S&O..
Schwartz.....B2W	2	140	34x3½	34x6	Buda...	4-3½x5½	4	Met-Gear..	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Gra...	Mon....	Suc...	1450	18	G&D...	Bosch..	S&O..
Schwartz.....C2W	3	150	36x4	36x8	Buda...	4-4½x5½	4	Met-Gear..	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Mon....	Suc...	1308	16	G&D...	Bosch..	S&O..
Schwartz.....DW	5	170	36x6	36x12	Buda...	4-4½x6	4	Met-Gear..	Fed.....	Cel...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Simp....	Suc...	1200	14	G&D...	Bosch..	S&O..
Selden.....A	1½	137½	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear..	Long....	Fin...	Ther..	Cir-Spl..	Ecc...	Stromb..	1	Gra...	Pier.....	Cent.	1200	18	NE....	Eis.....	O-C...
Selden.....2½A	2½	145	36x4	36x7	Cont....	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Ecc...	Stromb..	1	Gra...	Pier.....	Cent.	1200	16	NE....	Eis.....	O-C...
Selden.....3½2A	3½	162	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Ecc...	Stromb..	1½	Gra...	Pier.....	Cent.	1125	14	NE....	Eis.....	O-C...
Selden.....5A	5	164	36x5	40x12	Cont....	4-4½x6	2	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Cont....	Cent.	1125	13	NE....	Eis.....	O-C...
Service.....15	¾–1	132	34x4½p	35x5	Mid.....	4-3½x5	4	Com-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	.....	.....	1800	....	Remy..	Remy..	.....
Service.....31	1½	150	36x3½	36x6	Buda...	4-4x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	.....	.....	1300	....	West..	Eis.....	.....
Service.....36	1½–2	150	36x6p	38x7p	Buda...	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	.....	.....	1300	....	West..	Eis.....	.....
Service.....51	2½–3	160	36x4	36x7	Buda...	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	.....	.....	1300	....	West..	Eis.....	.....
Service.....71	3½	171	36x5	36x5d	Buda...	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	.....	.....	1300	....	West..	Eis.....	.....
Service.....76	3½	171	36x5	36x5d	Buda...	4-4½x6	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	.....	.....	1200	....	West..	Eis.....	.....
Service.....101	5	171½	36x6	40x6d	Buda...	4-4½x6	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	.....	.....	1200	....	West..	Eis.....	.....
Signal.....NF	1	132	34x5p	36x6p	Cont....	4-3½x5	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	....	Gra...	Pier.....	.....	.....	25	.....	Eis.....	.....
Signal.....H	1½	144	34x4	36x6	Cont....	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	....	Gra...	Pier.....	.....	.....	15	Delco..	Eis.....	.....
Signal.....J	2½	150	34x4	36x8	Cont....	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	....	Gra...	Pier.....	Cent.	.....	15	Delco..	Eis.....	.....
Signal.....M	3½	168	36x5	40x10	Cont....	4-4½x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	....	Gra...	Pier.....	.....	.....	12	.....	Eis.....	.....
Signal.....R	5	180	36x6	40x12	Cont....	4-4½x6	2	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	.....	Stromb..	....	Gra...	Cont.....	.....	.....	12	.....	Eis.....	.....
Standard.....IK	1½	134	34x3½	34x5	Cont....	4-3½x5	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	1	Gra...	Mon....	Suc...	1200	17	.....	.....	.....
Standard.....76	2½–3	140	36x4	34x7	Cont....	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	1½	Gra...	Mon....	Suc...	1200	15	.....	.....	.....
Standard.....66	3½–4	160	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Pist...	Stromb..	1½	Vac.....	Mon....	Suc...	1100	12	.....	.....	.....
Standard.....5K	5–6	164	36x6	40x12	Cont....	4-4½x6	2	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1½	Vac.....	Cont....	Cent.	1000	10	.....	.....	.....
Sterling.....1½	1½	142	36x3½*	36x5*	Own.....	4-4x5½	2	Met-Gear..	McCo...	Cel...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac.....	Wau....	Cent.	1050	16	G&D...	Eis.....	S-P...
Sterling.....2	2	142	36x4*	36x6*	Own.....	4-4x5½	2	Met-Gear..	McCo...	Cel...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac.....	Wau....	Cent.	1150	16	G&D...	Eis.....	S-P...
Sterling.....2½	2½	156	36x4*	36x4d*	Own.....	4-4½x5½	2	Met-Gear..	McCo...	Cel...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac.....	Wau....	Cent.	1080	15	G&D...	Eis.....	.....
Sterling.....3½2	3½	162	36x5*	40x5d*	Own.....	4-4½x6½	2	Met-Gear..	McCo...	Cel...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac.....	Wau....	Cent.	1030	14	West..	Eis.....	.....
Sterling.....5	5	168	36x6	40x6d	Own.....	4-5x6½	2	Met-Gear..	McCo...	Cel...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac.....	Wau....	Cent.	1030	14	West..	Eis.....	D-P...
Sterling.....5	5	174	36x6	40x5d	Own.....	4-5x6½	2	Met-Gear..	McCo...	Cel...	Pump.	Cir-Spl..	Gear..	.....	....	Vac.....	Wau....	Cent.	1000	18	West..	Eis.....	S-P...
Sterling.....7½	7½	174	36x6	40x7d	Own.....	4-5x6½	2	Met-Gear..	McCo...	Fin...	Pump.	Cir-Spl..	Gear..	Zenith...	1½	Vac.....	Wau....	Cent.	1000	16	West..	Eis.....	S-P...
Stoughton.....C	¾	131	34x4½p	34x4½p	.....	4-3½x5	4	Met-Gear.	Chic....	Fin...	Ther..	Cir-Spl..	Pist...	Stromb .	1	Gra.....	.....	.....	.....	...	.....	West..	.....
Stoughton.....A	1	130	35x5p	35x5p	Wau.....	4-3½x5½	4	.....	.....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1	Gra...	Wau....	Cent.	1200	...	Dyn.....	.....	.....
Stoughton.....B	1½	140½	36x3½	36x5	Wau.....	4-3½x5¼	4	Met-Gear.	.....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb..	1	Gra...	Wau....	Cent.	1200	...	Dyn.....	.....	.....
Stoughton.....D	2	140½	36x4	36x7	Her.....	4-4x5½	4	Met-Gear.	.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Dup....	Cent.	1400	...	West..	.....	.....
Stoughton.....F	3	158	36x5	36x5d	Her.....	4-4½x5½	4	Met-Gear.	.....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Dup....	Cent.	1200	...	West..	.....	.....
Sullivan.....E	2	150	36x4	36x7	Buda...	4-4½x5½	4	Met-Gear.	Bush....	Fin...	Pump.	Hol-Crk.	.....	Stromb..	1½	Vac.....	.....	.....	.....	...	.....	Bosch..	C-C...
Sullivan.....H	3½	156	36x5	36x5d	Buda...	4-4½x6	4	Met-Gear.	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	Pier.....	Cent.	1350	14	.....	.....	C-C...
Super Truck.....40	2	156	36x6*	40x8*	Wau.....	4-3½x5½	4	Met-Gear.	Chic....	Fin...	Pump.	Cir-Spl..	Gear..	Zenith...	1	Gra...	Wau....	Cent.	1100	13	.....	Bosch..	.....
Super Truck.....50	2½	156	36x4	36x8	Wis.....	4-4x6	4	Met-Gear.	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra...	Simp....	Cent.	1100	12	Vesta..	.....	.....
Super Truck.....70	3½	164	36x5	40x5d	Wis.....	4-4½x6	4	Met-Gear.	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra...	Simp....	Cent.	1100	11	Vesta..	Bosch..	.....
Super Truck.....100	5	164	36x5	40x12	Wis.....	4-4½x6	2	Met-Gear.	Chic....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra...	Simp....	Cent.	1100	11	Vesta..	.....	.....
Tiffin.....GW	1½	135	36x3½	38x5	Cont....	4-4½x5½	4	Met-Gear.	G&O....	Fin...	Pump.	Cir-Spl..	Pist...	Schebl..	1½	Gra...	Pier.....	Cent.	1200	16	West..	Bosch..	D-P...
Tiffin.....MW	2½	148	36x4	36x3½d	Cont....	4-4½x5¼	4	Met-Gear.	G&O....	Fin...	Pump.	Cir-Spl..	Pist...	Schebl..	1½	Gra...	Pier.....	Cent.	1200	14	West..	Bosch..	D-P...
Tiffin.....F35	3½	160	36x5	40x5d	Cont....	4-4½x5	2	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Pist...	Stromb..	1½	Gra...	Pier.....	Cent.	1100	14	West..	Bosch..	D-P...
Tiffin.....TW	5	168	36x6	40x6d	Cont....	4-4½x6	2	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Pist...	S hebl..	1½	Gra...	Cont....	Cent.	1100	12	West..	Bosch..	D-P...
Tiffin.....UW	6	168	36x6	40x12	Cont....	4-4½x6	2	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Pist...	Schebl..	1½	Gra...	Cont....	Cent.	1100	12	West..	Bosch..	D-P...
Titan.....	2	156	34x4*	36x7*	.....	4-4x5	...	.....	.....	.....	.....	.....	.....	Stromb..	.....	.....	.....	.....	.....	.....	.....	Eis.....	.....
Titan.....	3½	156	36x5	36x10	Buda...	4-4½x5½	...	.....	.....	.....	.....	.....	.....	Stromb..	.....	.....	Simp....	.....	1200	...	.....	Eis.....	.....
Titan.....	5	156	36x5	40x12	Buda...	4-4½x6	...	.....	.....	.....	.....	.....	.....	Stromb..	.....	.....	Simp....	.....	1100	15	.....	Eis.....	.....
Titan.....	6	156	36x5	40x12	Buda...	4-4½x6	...	.....	.....	.....	.....	.....	.....	Stromb..	.....	.....	Simp....	.....	1100	13	.....	Eis.....	.....
Tower.....J	1½	142	35x5p	38x7p	Cont....	4-4½x5½	4	Met-Gear.	Own....	Fin...	Pump.	Cir-Spl..	Pist...	.....	1½	Gra.....	.....	Cent.	.....	...	.....	.....	O-C...
Tower.....H	2½	146	36x4	36x8	Cont....	4-4½x5½	4	Met-Gear.	Bre.....	Fin...	Pump.	Cir-Spl..	Pist...	.....	1½	Gra...	Pier.....	.....	1160	15	.....	Eis.....	.....
Tower.....G	3½	165	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear.	Bre.....	Fin...	Pump.	Cir-Spl..	Pist...	.....	1½	Gra.....	.....	Cent.	1150	12	.....	.....	.....
Traffic.....Speedboy	1½	128	35x5p	35x5p	Cont....	4-3½x5	4	Met-Gear.	Own....	Cel...	Ther..	Cir-Spl..	Pist...	Carter..	1	Vac.....	.....	.....	1800	35	G&D...	Bosch..	O-C...
Transport.....20	1	130	34x3½*	34x4*	Buda...	4-3½x5½	4	Met-Gear.	Mod....	Cel...	Ther..	Cir-Spl..	Gear..	Stromb..	1	Gra...	Simp....	Cent.	1692	25	Eis.....	Eis.....	C-C...
Transport.....30	1½	140	34x3½*	34x4*	Cont....	4-3½x5	4	Met-Gear.	Mod....	Cel...	Ther..	Cir-Spl..	Pist...	Stromb..	1	Gra...	Simp....	Cent.	1680	25	Eis.....	Eis.....	C-C...
Transport.....50	2½	150	36x4*	36x8*	Cont....	4-4½x5½	4	Met-Gear.	Mod....	Cel...	Pump.	Cir-Spl..	Pist...	Stromb..	1½	Gra...	Dup....	Cent.	1210	18	Eis.....	Eis.....	C-C...
Transport.....70	3½	170	36x5*	36x10*	Buda...	4-4½x6	4	Met-Gear.	Mod....	Cel...	Pump.	.....	Gear..	.....	....	Gra...	Dup....	Cent.	1112	14	NE....	Eis.....	C-C...
Trabold.....K	2½	146	36x4*	36x7*	Buda...	4-4½x5½	4	Met-Gear.	AmC....	Fin...	Pump.	Hol-Crk.	Pist...	Zenith...	....	Gra.....	.....	.....	.....	...	.....	Aut-L..	.....
Traylor.....B	1½	140	34x3½	34x6	Buda...	4-3½x5½	4	Met-Gear.	G&O....	Fin...	Ther..	Hol-Crk.	Gear..	Zenith...	1	Gra.....	.....	.....	1900	30	West..	Splitd..	.....
Traylor.....C	2	146	36x4	36x7	Buda...	4-4x5½	4	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra...	Pier.....	Cent.	....	20	West..	Splitd..	.....
Traylor.....D	3	150	36x4	36x8	Buda...	4-4½x5½	4	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith ..	1½	Gra...	Pier.....	Cent.	....	18	West..	Splitd..	.....
Traylor.....E	4	170	36x5	40x5	Buda...	4-4½x6	4	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra...	Simp....	Cent.	....	15	West..	Bosch..	.....
Traylor.....F	5	170	36x6	40x6	Buda...	4-4½x6	4	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith...	1½	Gra...	Simp....	Cent.	....	15	West..	Bosch..	.....
Triangle.....AA	1	115	34x4½*	34x4½*	H-S.....	4-3½x5	4	Met-Gear.	Perf....	PT...	Ther..	Cir-Spl..	Gear..	Stromb..	1	Gra.....	.....	.....	2200	40	NE....	NE.....	O-C...
Triangle.....A	1½	144	34x3½*	34x6*	Wau.....	4-3½x5½	4	Met-Gear.	Perf....	PT...	Pump.	Cir-Spl..	Gear..	Stromb..	1	Gra...	Wau....	Cent.	1450	....	Eis.....	Eis.....	O-C...
Triangle.....C	2	147	36x4*	36x6*	Wau.....	4-3½x5½	4	Met-Gear.	Perf....	PT...	Pump.	Cir-Spl..	Gear..	Stromb..	1	Gra...	Wau....	Cent.	1450	....	Eis.....	Eis.....	O-C...
Triangle.....D	2½	150	36x4*	36x7*	Wau.....	4-4x5½	2	Met-Gear.	WR Co..	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Wau....	Cent.	1300	....	Splitd..	Eis.....	O-C...
Twin City.....BW	2	150	36x4	36x7	Buda...	4-4x5½	4	Met-Gear.	Mod....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac.....	Simp....	Cent.	1100	14	NE....	Bosch..	S&O..
Twin City.....AW	3½	168	36x5	40x5d	Own.....	4-4½x6	4	Met-Gear.	Mod....	Fin...	Pump.	Hol-Crk.	Gear..	Schebl..	1½	Vac.....	Own....	Cent.	1000	12	NE....	Bosch..	S&O..
Ultimate.....A	2	140	36x3½*	36x6*	Buda...	4-4½x5½	4	Met-Gear.	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Pier.....	Cent.	1600	20	Bosch..	Eis.....	.....
Ultimate.....BB	3	154	36x4	36x8	Buda...	4-4½x5½	4	Met-Gear.	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Pier.....	Cent.	1600	18	Bosch..	Eis.....	.....
Union.....FW	2½	155	36x5	36x8	Wis.....	4-4x6	4	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Schebl..	1½	Gra...	Dup....	Cent.	1072	15	Lee-N..	Eis.....	S&O..
Union.....HW	4	174	36x6	40x12	Wis.....	4-4½x6	4	Met-Gear.	G&O....	Fin...	Pump.	Hol-Crk.	Gear..	Schebl..	1½	Gra...	Dup....	Cent.	1430	15	Lee-N..	Eis.....	S&O..
Union.....JW	6	167	36x6	40x14	Wis.....	4-5x6	2	Met-Gear.	.....	Cel...	Pump.	Hol-Crk.	Gear..	King	1½	Gra...	Dup....	Cent.	1110	12	Lee-N..	Eis.....	S&O..
United.....AT	1½	145	34x3½	34x5	Buda...	4-3½x5½	4	Met-Gear.	Mod....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1	Gra...	Simp....	Cent.	1245	18	Remy..	Eis.....	.....

For abbreviations, see pages 350 and 351.

Trucks (Continued)

CLUTCH		TRANSMISSION												SPRINGS		BRAKES		STEERING		WHEELS			
		GEARSET				UNIVERSAL JOINTS		AXLES															
Make	Type	Make	Type	Location	Forward Speeds	Make	Type	Front Make	Rear Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Final Drive Type	Front	Rear	Service	Emergency	Steering Gear Make	Steering Gear Type	Make	Type	Frame Material	Make and Model
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Rowe FW
	D-M	Ful	SG	Un-WE					Col	5.55				½E	½E			Jac					Ruggles
						Spi			Own														Ruggles
Ful	D-M	Ful	SG	Un-WE	3	Blood	Met	Shu	She	7.80	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	MWCo	Art	P-S	Rumely A
Own	Pla	Chev	SG	Sep-Un	3	Own	Met	Olds	Cen	6.33	TT	TT	S-B	½E	½E	ExtR-W	IntR-W	Jac	S&N	Hayes	Art	P-S	Samson 15
Own	Pla	Mun	SG	Sep-Un	3	Own	Met	Cen	Cen	6.83	TT	TT	S-B	½E	½E	ExtR-W	IntR-W	Jac	S&N	Hayes	Art	P-S	Samson 25
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	Tim	Tim	7.00	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S	Stan	Art	P-S	Sandow G
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	She	She	8.90	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S	Stan	Art	P-S	Sandow CG
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	9.25	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S			P-S	Sandow J
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.33	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S			P-S	Sandow N
B-L	D-M	B-L	SG			Spi	Met	Tim	Tim	11.66	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S			P-S	Sandow L
B&B	Pla	B-L	SG	Sep-Un	4	Spi	Met	She	She	3.70	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Hoop	Art	P-S	Sandford 25
B&B	Pla	B-L	SG	Sep-Un	4	Spi	Met	She	She	3.70	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Hoop	Art	P-S	Sandford W35
B&B	Pla	B-L	SG	Sep-Un	4	Spi	Met	She	She	4.60	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Sandford W50
B&B	Pla	Own	SG	Sep-Un	4	M&E	Met	Own	Own	8.66	RR	TA	Worm	½E	½E	ExtDr	IntR-W	Own	W&W	StM	Art	R-S	Schacht F
B&B	Pla	Own	SG	Sep-Un	4	M&E	Met	Own	Own	9.66	RR	TA	Worm	½E	½E	ExtDr	IntR-W	Own	W&W	StM	Art	R-S	Schacht F
B&B	Pla	Own	SG	Sep-Un	8	M&E	Met	Own	Own	10.50	RR	TA	Worm	½E	½E	ExtDr	IntR-W	Own	W&W	StM	Art	R-S	Schacht E
B&B	Pla	Own	SG	Sep-Un	8	M&E	Met	Own	Own	14.00	RR	TA	Worm	½E	½E	ExtDr	IntR-W	Own	W&W	StM	Art	R-S	Schacht E
Ful	D-M	Ful	SG	Un-WE	3	M&E	Met	Shu	Eat	6.14	Sp	Sp	S-B	½E	½E	IntR-W	IntR-W	Ross	S&N	SWCo	Art	P-S	Schwartz A
Ful	D-M	Ful	SG	Un-WE	4	M&E	Met	Shu	She	8.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	SWCo	Art	P-S	Schwartz B2W
Ful	D-M	Ful	SG	Un-WE	4	M&E	Met	Shu	She	8.15	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	SWCo	Art	P-S	Schwartz C2W
Ful	D-M	Ful	SG	Sep-Un	4	M&E	Met	Shu	She	10.25	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Schwartz DW
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Lav	S&N	Arch	Art	P-S	Selden A
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim		RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Stan	C-S	P-S	Selden 2½A
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim		RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Stan	C-S	P-S	Selden 3½A
Det	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim		RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W	Stan	C-S	P-S	Selden 5A
B-L	D-M	B-L	SG	Un-WE	3	M&E	M&F	Own	Eat		Sp	Sp	S-B	¼T	½E	IntR-W	IntR-W	Own	W&S	Detroit	P-S	R-S	Service 15
B&B	Pla	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	Service 31
B&B	Pla	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	Service 36
B&B	Pla	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Bimel	Art	R-S	Service 51
B&B	Pla	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Stan	C-S	R-S	Service 71
B&B	Pla	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	7.80	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Stan	C-S	R-S	Service 76
B&B	Pla	B-L	SG	Sep-Un	4	M&E	Met	Tim	Tim	10.25	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Stan	C-S	R-S	Service 101
B-L	D-M	B-L	SG	Sep-Un	3	Spi	Met	Tim	Tim	7.20	RR		Worm	½E	½E	ExtR-W	IntR-W	Ross	S&N	StM	Art	P-S	Signal NF
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	7.75	RR		Worm		½E	ExtR-W	IntR-W	Ross	S&N	StM	Art	P-S	Signal H
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	9.25	RR		Worm	½E	½E	ExtR-W	IntR-W	Ross	S&N	StM	Art	P-S	Signal J
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	12.00	RR		Worm	½E	½E	ExtR-W	IntR-W	Ross	S&N	StM	Art	P-S	Signal M
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	11.66	RR		Worm	½E	½E	ExtR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Signal R
B-L	D-M	B-L	SG	Un-WE	3	Spi	Met	Tim	Tim	7.20	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Standard IK
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	8.50	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N		Art	R-S	Standard 76
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.30	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W		Art	P-S	Standard 66
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	11.33	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Gem	W&W		C-S	P-S	Standard 5K
B-L	D-M	B-L	SG	Un-WE	4		Met	Tim	Tim	7.00	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S	Prud	Art	P-S	Sterling 1½
B-L	D-M	B-L	SG	Un-WE	4		Met	Tim	Tim	7.70	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S	Prud	Art	P-S	Sterling 2
B-L	D-M	B-L	SG	Un-WE	4		Met	Tim	Tim	7.70	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S	Prud	Art	P-S	Sterling 2½
Hele	D-O	Own	CM	Sep-Un	3		Met	Tim	Tim	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S	Prud	Art	P-S	Sterling 3½
Hele	D-O	Own	CM	Sep-Un	3		Met	Tim	Tim	8.80	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&S	Prud	Art	P-S	Sterling S
Hele	D-O	Own	CM	Sep-Un	6	UMCo	Met	Cont	Own	7.04	RR	Sp	Ch	½E	½E	IntR-W	ExtDr	Ross	W&S	Smith	C-S	P-S	Sterling S
Hele	D-O	Own	CM	Sep-Un	6	UMCo	Met	Cont	Own	7.04	RR	Sp	Ch	½E	½E	IntR-W	Ext	Ross	W&S	Smith	C-S	P-S	Sterling 7½
				Un-WE	3	Therm	Fab	Col	Col	5.87	Sp	Sp	S-B	½E	½E	Ext	IntR-W		S&N		Art	P-S	Stoughton C
B-L	D-M	B-L	SG	Un-WE	3	Therm	Fab	She	She	6.00	RR	Sp	Worm	½E	½E	IntR-W	IntR-W		S&N		Art	P-S	Stoughton A
B-L	D-M	B-L	SG	Un-WE	3	Therm	Fab	She	She	7.80	RR	Sp	Worm	½E	½E	IntR-W	IntR-W		S&N		Art	P-S	Stoughton B
B-L	D-M	B-L	SG	Un-WE	4	Therm	Fab	She	She	8.66	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross			Art	P-S	Stoughton D
B-L	D-M	B-L	SG		4	Therm	Fab	She	She	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross			Art	P-S	Stoughton F
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	Tim	Tim	7.75	Sp	Sp	Worm	El	El	IntR-W	IntR-W	Ross	S&N	Wayne	Art	P-S	Sullivan E
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	Tim	Tim	10.33	RR	Sp	Worm	El	El	IntR-W	IntR-W	Ross	S&N	Wayne	Art	P-S	Sullivan H
Ful	D-M	Ful	SG	Un-WE	3	Therm	Fab	Shu	Wis		Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Lav	S&N	Prud	Art	P-S	Super Truck 40
Ful	D-M	Ful	SG	Un-WE	4	Therm	Fab	She	She	8.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Lav	S&N	Prud	Art	P-S	Super Truck 50
Ful	D-M	Ful	SG	Sep-Un	4	Spi	Met	She	She	10.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Super Truck 70
Ful	D-M	Ful	SG	Sep-Un	4	Spi	Met	She	She	10.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Super Truck 100
Ful	D-M	Ful	SG	Un-WE	3	Pet	Met	She	She	7.75	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Tiffin GW
Ful	D-M	Ful	SG	Un-WE	4	Pet	Met	She	She	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	P-S	Tiffin MW
Det	D-M	Cotta	CM	Sep-Un	4	Pet	Met	She	She	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Tiffin F3S
B&B	Pla	Cotta	CM	Sep-Un	4	Pet	Met	She	She	10.25	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Tiffin TW
B&B	Pla	Cotta	CM	Sep-Un	4	Pet	Met	She	She	10.25	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Tiffin UW
			CM		4			Own	Own					½E	½E	IntR-W							Titan
		Own	CM		4			Own	Own					½E	½E	IntR-W					C-S	P-S	Titan
		Own			4									½E	½E	IntR-W	IntR-W				C-S	P-S	Titan
		Own			4									½E	½E	IntR-W	IntR-W				C-S	P-S	Titan
Ful	D-M	Ful	SG	Un-WE			Met	Shu	Tim	7.25	RR	Sp	Worm	½E	½E	Int	Int	Ross	W&W		Art	P-S	Tower J
Ful	D-M	Ful	SG	Un-WE		Spi	Met	Tim	Tim		RR	Sp	Worm	½E	½E	Int	Int	Ross	S&N		Art	P-S	Tower H
Ful	D-M	Ful	SG	Un-WE	4	Spi	Met	Tim	Tim		RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Tower G
Cov	D-M	Cov	SG	Un-WE	3		Fab	Own	Rus	6.15	Sp	Sp	I-G	El	El	Ext	IntR-W	Own	W&W	Day	Art	R-S	Traffic Speedboy
Ful	D-M	Ful	SG	Un-WE	3	Snead	Fab	Col	Clark	7.25	Sp	Sp	I-G	½E	½E	Ext	IntR-W	Jac	S&N	Prud	Art	P-S	Transport 20
Ful	D-M	Ful	SG	Un-WE	3	Hart	Met	Col	Clark	7.60	Sp	Sp	I-G	½E	½E	ExtR-W	IntR-W	Jac	S&N	Prud	Art	P-S	Transport 30
Ful	D-M	Ful	SG	Un-WE	4	Hart	Met	Col	Clark	8.15	Sp	Sp	I-G	½E		Dr	IntR-W	Jac	S&N	Prud	Art	P-S	Transport 50
B&B	Pla	Cotta	CM	Un-WE	4	Hart	Met	Shu	Clark	10.00	Sp	Sp	I-G	½E	½E	Dr	IntR-W	Jac	S&N	Clark	C-S	P-S	Transport 70
Ful	D-M	Ful	SG	Un-WE	4						RR	TA	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N		Art	P-S	Trabold K
Cov	D-M	Cov	SG	Un-WE	3	M&E	Met	She	She	7.80	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Sch	Art	P-S	Traylor B
Cov	D-M	Cov	SG	Un-WE	3	M&E	Met	She	She	7.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Sch	Art	P-S	Traylor C
Own	Pla	Own	SG	Un-WE	4	Hart	Met	She	She	7.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Sch	Art	P-S	Traylor D
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	8.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S		Traylor E
B-L	D-M	B-L	SG	Sep-Un	4	Spi	Met	She	She	10.25	RR	Sp	Worm	½E	½E	ExtR-W	Ext	Ross	S&N	Smith	C-S	P-S	Traylor F
Ful	D-M	Ful	SG	Un-WE	3	Uni	Met	Tor	Clark	6.75	Sp	Sp	I-G	½E	½E	ExtDr	ExtR-W	Gem	W&W	North	Art	R-S	Triangle AA
Ful	D-M	Ful	SG	Un-WE	3	Uni	Met	Col	Clark	7.25	Sp	Sp	I-G	½E	½E	ExtDr	ExtR-W	Gem	W&W		Art	R-S	Triangle A
Ful	D-M	Ful	SG	Un-WE	3	Uni	Met	Tor	Clark	9.00	Sp	Sp	I-G	½E	½E	ExtDr	ExtR-W	Gem	W&W			R-S	Triangle C
Ful	D-M	Ful	SG	Un-WE	4	Uni	Met	Tor	Clark	9.00	Sp	Sp	I-G	½E	½E	ExtDr	ExtR-W	Gem	W&W			R-S	Triangle D
Ful	D-M	Ful	SG	Un-WE	3	Arvac	Met	Shu	Clark	8.00	Sp	Sp	I-G	½E	½E	Ext	IntR-W	Ross	S&N	Bimel	Art	R-S	Twin City BW
B&B	Pla	Ful	SG	Sep-Un	4		M&F	Tim	Tim	10.33	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	S&N	Smith	C-S	R-S	Twin City AW
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	6.50	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross	W&W	Jones	Art	P-S	Ultimate A
B-L	D-M	B-L	SG	Un-WE	4	Spi	Met	She	She	7.75	RR	Sp	Worm	½E	½E	IntR-W	IntR-W	Ross		Jones	Art	P-S	Ultimate BB
Ful	D-M	Ful	SG	Un-WE	4	Uni	Met	She	Wal	7.66	Sp	Sp	B-S	El	El	ExtDr	IntR-W	Ross	S&N		Art	P-S	Union FW
Ful	D-M	Ful	SG	Sep-Un	4	Uni	Met	Shu	Wal	11.50	Sp	Sp	B-S	El	El	ExtDr	IntR-W	Ross	S&N		C-S	P-S	Union HW
Ful	D-M	Ful	SG	Sep-Un	4	M&E		Sav	Wal	10.50	Sp	Sp	B-S	El	El	ExtDr	IntR-W	Ross	S&N	Smith	C-S	P-S	Union JW
Ful	D-M	Ful	SG	Un-WE	3	Spi	Met	She	She	7.00	Sp	Sp	Worm	½E	½E	IntR-W	IntR-W	Jac	S&N		Art	P-S	United AT

For abbreviations, see pages 350 and 351.

Specifications of American

Make and Model	Tons Capacity	Wheel-Base, Ins.	TIRE SIZE		ENGINE															ELECTRICAL SYSTEM		
												OILING SYSTEM		FUEL SYSTEM			GOVERNOR		SPEED				
			Front, Ins.	Rear, Ins.	Make	Number Cylinders, Bore and Stroke	Cylinders Cast	Camshaft Drive Type	Radiator Core Make	Radiator Core Type	Water Circulation	Type	Oil Pump Type	Carbureter Make	Carbureter Size, Ins.	Fuel Feed	Make	Type	Motor in R.P.M.	Truck in M.P.H.	Generator Make	Ignition System, Make	Ignition System, Type
United.....BT	2½	....	36x4	36x7	Buda...	4-4¼x5½	4	Met-Gear..	Mod....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Simp....	Cent..	1225	15	Remy..	Eis....	.....
United.....CT	3½	157	36x5	36x5d	Buda...	4-4¼x5½	4	Met-Gear..	Mod....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Simp....	Cent..	1233	13	Remy..	Eis....	.....
United States.....N	1½	144	36x3½	36x5	Cont....	4-3⅞x5	4	Met-Gear..	Long....	Fin...	Pump.	Cir-Spl..	Ecc...	Stromb..	1	Vac....	.....	.....	1400	19	Bosch..	Bosch..	.....
United States.....R	3	156	36x4	36x4d	Hink....	4-4x5½	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1400	17	Bosch..	Eis....	.....
United States.....S	4	168	36x5	36x5d	Hink....	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Vac...	Hink....	Cent..	1200	12	Bosch..	Eis....	.....
Velie.....46	1½	133	36x3½	36x5	Cont....	4-3⅞x5	4	N-M-G....	McCo...	F'n...	Pump.	Cir-Spl..	Ecc...	Stromb..	1	Gra...	Mon....	Suc...	....	16	Bijur...	.....	C-C...
Veteran.....E	1½	186	34x5p	34x5p	Buda...	4-3⅞x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1	Vac..	Dup....	Cent..	....	20	.....	.....	C-C...
Veteran.....D	2½	156	36x4	36x7	Buda...	4-4¼x5½	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Vac..	Dup....	Cent..	1000	18	.....	Eis....	C-C...
Veteran.....H	3½–4	156	36x5	36x10	Buda...	4-4¼x6	4	Met-Gear..	McCo...	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Vac..	Simp....	Cent..	1000	14	.....	Eis....	C-C...
Vim.....29	½	108	31x4p	31x4p	Own....	4-3¼x4½	4	Met-Gear..	.....	Fin...	.....	Cir-Spl..	Ecc...	Zenith..	½	Gra...	West....	West..	2030	33	.....	.....	O-C...
Vim.....30	½	127	32 4½p	32x4½p	Own....	.....	4	.....	.....	Fin...	Ther..	Cir-Spl..	Ecc...	Zenith..	.....	Gra...	.....	West..	200	33	.....	.....	O-C...
Vim.....31	1	125	35x5p	35x5p	Her....	4-3⅞x5½	4	Met-Gear..	.....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1	Gra...	.....	.....	1800	30	.....	Splitd..	O-C...
Vim.....23	3	175	36x5	36x5	Her....	4-4¼x5½	4	Met-Gear..	.....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Dup....	Suc...	1250	14	.....	Splitd..	O-C...
Vulcan.....25	2½	148	36x4*	36x8*	Wis....	4-4¼x6	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Pier....	Cent..	1250	15	.....	Eis....	.....
Vulcan.....35	3½	168	36x5	40x10	Wis....	4-4¼x6	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1¼	Gra...	Pier....	Cent..	1150	11	.....	.....	.....
Walker Johnson.....A	2	140	34x3½	34x6	Buda...	4-3⅞x5½	4	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1	Vac..	.....	.....	1700	30	.....	Eis....	.....
Walker Johnson.....B	3	150	36x4	36x8	Buda...	4-4¼x5½	4	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Zenith..	1½	Gra...	Pier....	Cent..	1440	18	Eis....	Eis....	.....
Walter.....15	5	168	36x6	40x6d	Wau....	4-4½x6½	2	Met-Gear..	Bush....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb..	1½	Gra...	Wau....	Cent..	1100	15	West...	Apollo..	.....
Watson.....1	1	128	34x5p	34x5p	Buda...	4-3⅞x5½	4	Met-Gear..	G&O....	Cel...	Pump.	Cir-Spl..	.....	Zenith..	1	Gra...	.....	.....	.....	35	Dyn....	.....	.....
White.....15–45	½	143½	34x5p	34x5p	Own....	4-4¼x5½	4	Met-Gear..	.....	Cel...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac..	Own....	Cent..	.....	.....	.....	.....	.....
White.....15	¾	133½	34x5p	34x5p	Own....	4-3⅞x5½	4	Met-Gear..	.....	Cel...	Pump.	.....	Pist...	Own....	1½	Gra...	.....	.....	.....	.....	.....	.....	.....
White.....20	2	145½	36x4	36x4d	Own....	4-3⅞x5½	4	Met-Gear..	.....	Cel...	Pump.	.....	Pist...	Own....	1½	Gra...	.....	.....	.....	.....	.....	.....	.....
White.....20–45	2	168	36x4*	36x4d*	Own....	4-4¼x5½	4	Met-Gear..	.....	Cel...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac..	Own....	Cent..	.....	.....	.....	.....	.....
White.....40	3½	174	36x5	40x5d	Own....	4-3⅞x5½	4	Met-Gear..	.....	Fin...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac..	Own....	Cent..	.....	.....	.....	.....	.....
White.....45	5	174	36x6	40x6d	Own....	4-4¼x5½	4	Met-Gear..	.....	Fin...	Pump.	Hol-Crk.	Gear..	Own....	1½	Vac..	Own....	Cent..	.....	.....	.....	.....	.....
White Hickory.....	1	134	34x5p	34x5p	Cont....	4-3⅞x5	4	Met-Gear..	Chic....	Fin...	.....	.....	.....	Stromb..	....	Vac..	Dup....	Cent..	1310	22	.....	Eis....	.....
White Hickory.....H	1½	144	36x3½	36x5	Cont....	4-3⅞x5	4	.....	Chic....	Fin...	.....	.....	.....	Stromb..	....	Vac..	Dup....	Cent..	1190	15	.....	Eis....	.....
White Hickory.....	3½	156	36x5	36x5d	Cont....	4-4¼x5½	2	.....	Chic....	Fin...	.....	.....	.....	Stromb..	....	Vac..	Dup....	Cent..	1157	12	.....	Eis....	.....
Wichita.....K	1	144	36x3*	36x4*	Wau....	4-3⅞x5½	4	Met-Gear..	E&M...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	Gra...	Wau....	Cent..	1000	13	NE....	Eis....	.....
Wichita.....L	1½	144	36x3½*	36x5*	Wau....	4-3⅞x5½	4	Met-Gear..	E&M...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	Gra...	Wau....	Cent..	1000	12	NE....	Eis....	.....
Wichita.....M	2	144	35x5*	36x6*	Wau....	4-3⅞x5½	4	Met-Gear..	E&M...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	Gra...	Wau....	Cent..	1000	12	NE....	Eis....	.....
Wichita.....R	2½	144	36x4*	36x7*	Wau....	4-3⅞x5½	4	Met-Gear..	E&M...	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	Gra...	Wau....	Cent..	1000	12	NE....	Eis....	S-P...
Wichita.....RX	2½	160	36x4*	36x8*	Wau....	4-4¼x5½	2	Met-Gear..	E&M...	Cel...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Gra...	Wau....	Cent..	1000	12	NE....	Eis....	S-P...
Wichita.....O	3½	165	36x5	36x5d	Wau....	4-4¼x6½	2	Met-Gear..	E&M...	Cel...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Gra...	Wau....	Cent..	1000	9	NE....	Eis....	S-P...
Wichita.....S	5	165	36x6	40x6d	Wau....	4-4½x6½	2	Met-Gear..	E&M...	Cel...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Gra...	Wau....	Cent..	1000	8	NE....	Eis....	S-P...
Wilcox Trux.....	1	130	36x4*	36x4*	Buda...	4-3⅞x5½	4	Com-Gear.	Long....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1	Gra...	Simp....	Cent..	1500	....	West..	.....	.....
Wilcox Trux.....B	1½	135	36x4*	36x5*	Own....	4-4¼x5	2	Com-Gear.	Long....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	Gra...	Dup....	Cent..	1100	....	.....	.....	.....
Wilcox Trux.....C	2½	150	36x4*	36x3½*	Own....	4-4¼x5	2	Com-Gear.	Long....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	Gra...	.....	Cent..	1100	....	.....	.....	.....
Wilcox Trux.....E	3½	162	36x5*	36x5d*	Buda...	4-4¼x6	4	Com-Gear.	Long....	Fin...	Pump.	.....	Gear..	Stromb.	1½	Gra...	Dup....	Cent..	1100	....	West..	.....	.....
Wilcox Trux.....F	5	162	36x5	40x12	Buda...	4-4½x6½	4	Com-Gear.	Long....	Fin...	Pump.	Cir-Spl..	Gear..	Stromb.	1½	.....	.....	.....	1090	....	.....	.....	.....
Wilson.....F	1½	140	36x3½	36x5	Own....	4-3⅞x5	4	Met-Gear..	Long....	Fin...	Ther..	Cir-Spl..	Pist..	Stromb.	1	Gra...	Pier....	Cent..	1100	19	Eis....	.....	.....
Wilson.....EA	2½	152	36x4	36x7	Own....	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Pist..	Stromb.	1½	Gra...	Pier....	Cent..	1100	15	Eis....	.....	.....
Wilson.....G	3½	160	36x5	36x5d	Own....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Pist..	Stromb.	1½	Vac..	Pier....	Cent..	1100	15	Eis....	.....	.....
Wilson.....H	5	160	36x6	40x6d	Own....	4-4½x6	2	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Pist..	Stromb.	1½	Vac..	Pier....	Cent..	1100	15	Eis....	.....	.....
Winther.....751	½–1	135	34x4½p	35x5p	H-S....	4-3½x5	4	Met-Gear..	Bre....	PT...	Ther..	Cir-Spl..	Gear..	Stromb.	1	Vac..	.....	.....	1600	30	West..	West..	O-C...
Winther.....39	1½	140	34x3½	34x5	Wis....	4-3⅞x5	4	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Vac..	.....	.....	1400	20	Eis....	Eis....	O-C...
Winther.....430	1½	132	32x4	32x4	Wis....	4-3⅞x5	4	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Gra...	.....	.....	1400	15	Eis....	Eis....	O-C...
Winther.....49	2	147	34x4	34x4d	Wis....	4-4x5	4	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Vac..	.....	.....	1400	17	Eis....	Eis....	O-C...
Winther.....50	2½	110	36x6p	42x9p	Wis....	4-4x6	4	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Master.	1½	Vac..	.....	.....	1250	18	West..	West..	O-C...
Winther.....450	2½	150	34x5	36x6	Wis....	4-4x5	4	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Gra...	.....	.....	1400	13	Eis....	Eis....	O-C...
Winther.....70	3½	150	36x5	36x5d	Wis....	4-4x6	4	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Master.	1½	Vac..	.....	.....	1250	15	West..	West..	O-C...
Winther.....109	5	162	36x6	40x6d	Wis....	4-4½x6	4	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Master.	1½	Vac..	Dup....	Cent..	1200	12	West..	Eis....	O-C...
Winther.....140	7	162	36x6	40x7d	Wis....	4-5x6	2	Met-Gear..	Bre....	PT...	Pump.	Hol-Crk.	Gear..	Master.	1½	Vac..	Dup....	Cent..	1000	10	West..	Eis....	O-C...
Witt-Will.....N	1½	144	36x3½	36x7	Cont....	4-3⅞x5	4	.....	Bre....	Fin...	Pump.	Cir-Spl..	Pist..	Zenith..	1½	Gra...	Pier....	Cent..	1500	25	.....	Eis....	S-P...
Witt-Will.....P	2½	144	36x3½	36x7d	Cont....	4-4½x5½	4	Met-Gear..	Bre....	Cel...	Pump.	Cir-Spl..	Pist..	Zenith..	1½	Gra...	Pier....	Cent..	1500	40	.....	Eis....	S-P...
Wolverine.....J1	1	140	34x3½*	34x5*	Cont....	4-3⅞x5	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb.	1	Gra...	Pharo...	O-Op..	1400	18	Bosch..	Eis....	.....
Wolverine.....J1½	1½	140	34x3½*	34x5*	Cont....	4-3⅞x5	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb.	1	Gra...	Pharo...	O-Op..	1480	18	Bosch..	.....	.....
Wolverine.....J2	2	148	34x4*	34x7*	Cont....	4-3⅞x5	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb.	1	Gra...	Pharo...	O-Op..	1400	18	Bosch..	Eis....	.....
Wolverine.....K	2½–3	168	36x4*	36x8*	Cont....	4-4½x5½	4	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Gra...	Pharo...	O-Op..	1300	14	Bosch..	Eis....	.....
Wolverine.....L	3½	186	36x5	36x10	Cont....	4-4½x5½	2	Met-Gear..	Long....	Fin...	Pump.	Hol-Crk.	Gear..	Stromb.	1½	Gra...	Pharo...	O-Op..	1200	12	Bosch..	Eis....	.....

For abbreviations, see pages 350 and 351.

1922 Specifications of

MAKE AND MODEL	Load Capacity in Tons	Wheel-base in Inches	TIRES			Distance from Ground to Top of Frame Ins.	BATTERY						MILES PER CHARGE	MOTOR				SPEED IN MILES PER HOUR		CONTROLLER		DRIVE			
			Kind	SIZE IN INCHES			Location	Make	No. Plates per Cell	No. Cells	No. Trays	Amp. Hr. Capacity	Loaded	Location and Number	Make	Horsepower	Voltage	Light	Loaded	Location	Speeds Ahead	GEARING		Total Gear Reduction	Propulsion Taken by†
				Front	Rear																	First Reduction	Final Drive		
C. T.....BR2-A	¾	91½	solid*.	36x3	36x3½	32½	amid-u	Ex*...	9*	42*	5*	136*	45*	unit-x-2.	G.E..	1½	84	14	13	st-col..	4	spur...	spur..	11.5–1	rad-rd*.
C. T.....BR2	1	101	solid*.	36x3½	36x4	32½	amid-u	Ex*...	11*	42*	5*	170*	50*	unit-x-2.	G.E..	1½	84	14	12	st-col.	4	spur...	spur..	11.5–1	rad-rd*.
C. T.....BR-4	2	116	solid*.	36x4	36x4d	35 7/16	amid-u	Ex*...	15*	42*	6*	238*	50*	unit-x-2.	G.E..	2	84	12	10	st-col..	4	spur...	spur..	12.14–1	rad-rd*.
C. T.....AR-7	3½	126	solid*.	36x5	36x5d	36½	amid-u	Ex....	19*	42*	6*	306*	40*	unit-x-2.	G.E..	2	84	10	8	st-col.	4	spur...	spur..	17.32–1	rad-rd*.
C. T.....AK-7	3½	122	solid*.	36x6	36x4d	38½	amid-u	Ex....	19*	42*	6*	306*	45*	unit-x-4.	G.E..	1½	84	11	9	st-col.	4	spur...	spur..	17.32–1	rad-rd*.
C. T.....AK-10	5	132	solid*.	36x7	36x4d	38½	amid-u	Ex....	21*	42*	9*	340*	45*	unit-x-4.	G.E..	1½	84	10	8	st-col.	.....	spur...	spur..	20.14–1	rad-rd*.
Lansden.....G	½	96	pneu..	32x4½	32x4½	30	opt....	Ex....	9*	44*	4*	136*	50*	unit-x-1.	G.E..	.....	88	16½	15	indash	4	her.....	bevel..	11.12–1	springs.
Lansden.....M	1	108	solid..	36x3	36x3½	34	amid-u	Ex....	11*	44*	10*	170*	50*	unit-j-1.	G.E..	.....	88	12	10	in dash	4	bevel...	rol-ch.	11.9–1	rad-rd..
Lansden.....M	2	121	solid..	36x4	36x3d	36	amid-u	Ex....	15*	44*	6*	238*	50*	unit-j-1.	G.E..	.....	88	11	9	in dash	4	bevel...	rol-ch.	12.8–1	rad-rd..
Lansden.....M	3½	133	solid..	36x5	36x4d	39	amid-u	Ex....	17*	44*	6*	272*	45*	unit-j-1.	G.E..	.....	88	10	8	in dash	4	bevel...	rol-ch.	13.1 –1	rad-rd..
Lansden.....M	5	146	solid..	36x6	36x5d	39	amid-u	Ex....	19*	44*	6*	306*	40*	unit-j-1.	G.E..	.....	88	9	7	in dash	4	bevel...	rol-ch.	12.3 –1	rad-rd..
TEC.....1102	2½	65½	solid..	20x5	20x5	.....	amid-u	Ex*...	9*	34*	5*	136*	.....	in whls-4	G.E..	18 Max	60	10	7	in dash	3	spur...	int-g..	14.00–1	springs.

Trucks (Continued)

CLUTCH		TRANSMISSION											SPRINGS		BRAKES		STEERING		WHEELS			
		GEARSET †				UNIVERSAL JOINTS		AXLES														
Make	Type	Make	Type	Location	Forward Speeds	Make	Type	Front Make	Rear Make	Total Gear Reduction	Propulsion Taken By	Torque Taken By	Final Drive Type	Front	Rear	Service	Emergency	Steering Gear Make	Steering Gear Type	Make	Type	Frame Material	Make and Model
Ful	D-M	Ful	SG	Sep-Un	4	Spi	Met	She	She	8.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Lav.	S&N.		C-S.	P-S.	United BT
Ful	D-M	Ful	SG	Sep-Un.	4	Spi	Met	She	She	10.25	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Lav.	S&N.		C-S.	P-S.	United CT
Ful	D-M	Ful	SG	Un-WE.	3	Blood	Met	Shu	Clark	7.60	Sp.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Lav.	S&N.	Sch	Art.	P-S.	United States N
B-L	D-M	B-L	SG	Sep-Un.	4		F&B	She	She	8.70	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Lav.	S&N.	Sch	Art.	P-S.	United States R
B-L	D-M	B-L	SG	Sep-Un.	4		M&F	She	She	10.25	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Lav.	S&N.	Sch	Art.	P-S.	United States S
B&B	Pla	Dur	SG	Un-WE.		Arvac	Met	Col	Tor	8.00	Sp.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Ross.	S&N.	Mut	Art.	P-S.	Velie 46
B&B	Pla	Cotta	CM.	Un-WE.	3	Spi	Met	She	She	6.50	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Smith	C-S.	R-S.	Veteran E
B&B	Pla	Cotta	CM.	Un-WE.		Spi	Met	She	She	7.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Smith	C-S.	R-S.	Veteran D
B&B	Pla	Cotta	CM.	Un-WE.	4	Spi	Met	She	She	8.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Smith	C-S.	R-S.	Veteran H
B&B	Pla		SG	Un-WE.	3		Met			5.50	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.		W&W.		Art.	P-S.	Vim 29
B&B	Pla	Own	SG	Un-WE.			Met			5.50	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.		W&W.		Art.	P-S.	Vim 30
Cov	D-M	Cov	SG	Un-WE.	3		Met			6.50	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.		W&W.		Art.	P-S.	Vim 31
B-L	D-M	B-L	SG	Sep-Un.	4		Met			7.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.		W&W.		C-S.	P-S.	Vim 23
B-L	D-M	B-L	SG	Sep-Un.	4	Spi	Met	She	She	8.75	RR.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Smith	C-S.	P-S.	Vulcan 25
B-L	D-M	B-L	SG	Sep-Un.	4	Therm	Fab	She	She	11.75	RR.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Smith	C-S.	P-S.	Vulcan 35
Ful	D-M	Ful	SG	Un-WE.	3	Spi	Met	Tim	Tim	7.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Arch	Art.	P-S.	Walker Johnson A
Ful	D-M	Ful	SG	Un-WE.	4	Spi	Met	Tim	Tim	8.50	Sp.	Sp.	Worm		½E.	IntR-W.	IntR-W.	Ross.	S&N.	Arch	Art.	P-S.	Walker Johnson B
B-L	D-M	War	SG	Sep-Un.	4	M&E	Met	Own	Own	9.00	Sp.	Sp.	I-G	El.	El.	ExtR-W.	IntR-W.	Ross.	S&N.	Day	C-S.	P-S.	Walter 15
B-L	D-M	B-L	SG	Un-WE.		Spi	Met	Shu	Shu	2.00	Sp.	Sp.	S-B	½E.	½E.			Ross.	S&N.		Art.	P-S.	Watson
Own	Pla	Own	SG	Un-WE.		Own	Met	Own	Own		RR.	Sp.	S-B	½E.	½E.	ExtR-W.	IntR-W.	Own	W&S.	Own	Art.	P-S.	White 15–45
Own	Pla	Own	SG	Sep-Un.	4	Own	Met	Own	Own		RR.	Sp.	S-B	½E.	½E.	ExtR-W.	IntR-W.	Own	W&S.	Own	Art.	P-S.	White 15
Own	Pla	Own	SG	Sep-Un.	4	Own	Met	Own	Own		RR.	Sp.	B-S	½E.	½E.	ExtR-W.	IntR-W.	Own	W&S.	Own	C-S.	P-S.	White 20
Own	Pla	Own	SG	Un-WE.	4	Own	Met	Own	Own		RR.	Sp.	B-S	½E.	½E.	Dr.	IntR-W.	Own	W&S.	Own	C-S.	P-S.	White 20–45
Own	Pla	Own	SG	Un-WE.	4	Own	Met	Own	Own		RR.	Sp.	I-G	½E.	½E.	Dr.	IntR-W.	Own	W&S.	Own	C-S.	R-S.	White 40
Own	Pla	Own	SG	Un-WE.	4	Own	Met	Own	Own		RR.	Sp.	I-G	½E.	½E.	Dr.	IntR-W.	Own	W&S.	Own	C-S.	R-S.	White 45
Ful	D-M	Ful	SG	Un-WE.	3	M&E	Met	Tim	Tim		Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Lav.		Bimel	Art.	P-S.	White Hickory
Ful	D-M	Ful	SG	Un-WE.	3	Arvac	Met	Tim	Tim		RR.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.		Bimel	Art.	P-S.	White Hickory H
Ful	D-M	Ful	SG	Sep-Un.	4	M&E	Met	Tim	Tim		RR.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Lav.		Smith	Art.	P-S.	White Hickory
Own	Con	B-L	SG	Sep-Un.	4	Own	Fab	She	She	7.80	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Bimel	Art.	P-S.	Wichita K
Own	Con	B-L	SG	Sep-Un.	4	Own	Fab	She	She	8.60	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Bimel	Art.	P-S.	Wichita L
Own	Con	B-L	SG	Sep-Un.	4	Own	Fab	She	She	8.60	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Bimel	Art.	P-S.	Wichita M
Own	Con	B-L	SG	Sep-Un.	4	Own	Fab	She	She	10.33	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Day	C-S.	P-S.	Wichita R
Hart	Con	B-L	SG	Sep-Un.	4	Own	Fab	She	She	8.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Day	C-S.	P-S.	Wichita RX
Hart	Con	B-L	SG	Sep-Un.	4	Own	Fab	She	She	11.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Smith	C-S.	P-S.	Wichita O
Hart	Con		SG	Sep-Un.	4	Own	Fab	She	Sav	14.00	Sp.	Sp.	B-S	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Smith	C-S.	P-S.	Wichita S
B-L	D-M	B-L	SG	Un-WE.		Det	Met	Shu	She		Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Gem	W&W.		Art.	P-S.	Wilcox Trux
M&E	D-M	Own	SG	Sep-Un.	4		F&M	Tim	Wal		Sp.	Sp.	Worm	½E.	½E.	IntR-W.	ExtR-W.	Own	W&W.	Smith	C-S.	P-S.	Wilcox Trux B
M&E	D-M	Own	SG	Sep-Un.		Hart	F&M	Shu	Wal		Sp.	Sp.	Worm	½E.	½E.	R-W.	R-W.	Own	W&W.	Smith	C-S.	P-S.	Wilcox Trux C
M&E	D-M	Own	SG	Sep-Un.		Uni	Met	Tim	Wal		RR.		Worm	½E.	½E.	R-W.	R-W.	Own	W&W.	Smith	C-S.	P-S.	Wilcox Trux E
M&E	D-M	Own	SG			Uni	F&M	Tim	Wal														Wilcox Trux F
B&B	Pla	Cotta	CM.	Sep-Un.	4	Therm	F&M	Tim	Tim	6.00	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.		Art.	R-S.	Wilson F
B&B	Pla	Cotta	CM.	Sep-Un.	4	Therm	Met	Tim	Tim	7.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.		Art.	R-S.	Wilson EA
B&B	Pla	Cotta	CM.	Sep-Un.	4	Therm	F&M	Tim	Tim	8.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.		C-S.	R-S.	Wilson G
B&B	Pla	Cotta	CM.	Sep-Un.		Therm	M&E	Tim	Tim	10.25	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.		C-S.	R-S.	Wilson H
War	D-M	War	SG	Un-WE.	3	Pet	Met	Tor	Tor	6.60	Sp.	Sp.	I-G	½E.	½E.	ExtDr.	ExtR-W.	Lav.	S&N.	MWCo.	Art.	R-S.	Winther 751
Ful	D-M	Ful	SG	Un-WE.	3	Pet	Met	Col	Med	7.00	Sp.	Sp.	I-G	½E.	½E.	Ext.	ExtDr.	Lav.	S&N.	Med	C-S.	R-S.	Winther 39
Ful	D-M	Ful	SG	Un-WE.	3	Pet	Met	Own	Med	9.00	Sp.	Sp.	I-G	½E.	½E.		ExtDr.	Lav.	S&N.	Med	C-S.	R-S.	Winther 430
B&B	Pla	B-L	SG	Sep-Un.	4	Blood	Met	Tor	Clark	8.08	Sp.	Sp.	I-G	½E.	½E.	ExtR-W.	ExtR-W.	Ross.	S&N.	Med	C-S.	R-S.	Winther 49
Ful	D-M	B-L	SG	Sep-Un.	4	Blood	Met	Tor	Clark	8.00	Sp.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Ross.	S&N.	Own	C-S.	R-S.	Winther 50
Ful	D-M	Ful	SG	Sep-Un.	3	Pet	Met	Own	Clark	12.00	Sp.	Sp.	I-G	½E.	½E.	ExtR-W.	ExtDr.	Lav.	S&N.	Med	C-S.	R-S.	Winther 450
B&B	Pla	B-L	SG	Sep-Un.	4	Blood	Met	Tim	Clark	9.00	Sp.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Ross.	S&N.	Clark	C-S.	R-S.	Winther 70
B&B	Pla	B-L	SG	Sep-Un.	4	Blood	Met	Tim	Clark	12.50	Sp.	Sp.	I-G	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Clark	C-S.	R-S.	Winther 109
B&B	Pla	B-L	SG	Sep-Un.	4	Pet	Met	Tim	Clark	12.50	Sp.	Sp.	I-G	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Clark	C-S.	R-S.	Winther 140
B-L	D-M	B-L	SG	Un-WE.	3	Spi	Met	Tim	Tim	7.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Arch	Art.	P-S.	Witt-Will N
B-L	D-M	B-L	SG	Un-WE.	3	Spi	Met	Tim	Tim	7.75	Sp.	Sp.	Worm	½E.	½E.	IntR-W.	IntR-W.	Ross.	S&N.	Arch	Art.	P-S.	Witt-Will P
Ful	D-M	Ful	SG	Un-WE.		Uni	Met	Shu	Rus	8.20	RR.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Gem			Art.	P-S.	Wolverine J1
Ful	D-M	Ful	SG	Un-WE.	3	Uni	Met	Shu	Rus	8.80	RR.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Gem	W&W.		Art.	P-S.	Wolverine J1½
Ful	D-M	Ful	SG	Un-WE.	3	Uni	Met	Shu	Rus	8.80	RR.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Gem	W&W.		Art.	P-S.	Wolverine J2
Ful	D-M	Ful	SG	Un-WE.		Uni	Met	Shu	Rus	9.40	RR.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Ross.	S&N.		C-S.	R-S.	Wolverine K
Ful	D-M	Ful	SG	Un-WE.	4	Uni	Met	Shu	Clark	10.00	RR.	Sp.	I-G	½E.	½E.	ExtR-W.	IntR-W.	Ross.	S&N.	Clark	C-S.	R-S.	Wolverine

For abbreviations, see pages 350 and 351.

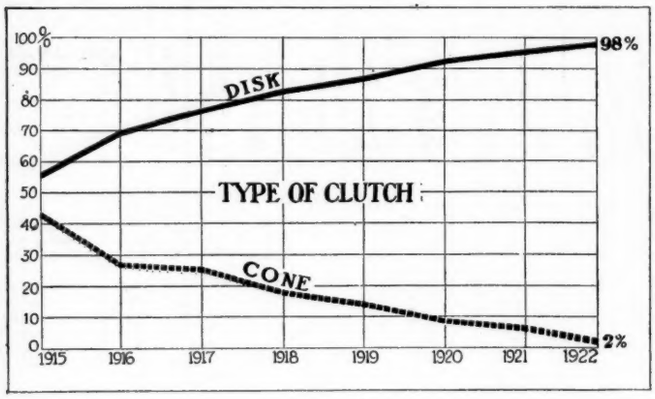
American Electric Trucks

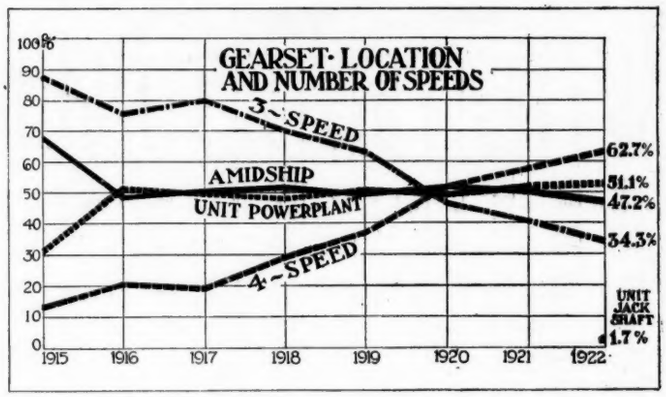
TEC	1202	2½	91	solid	20x5	20x5		amid-u	Ex*	9*	34*	5*	136*		in whls-4	G.E.	18 Max	60	10	7	in dash	3	spur	int-g	14.00–1	springs.
Walker	M	½	94	solid	34x3	36x3½	33	amid-u	opt						unit-x-1	West.	3	60	15	14	u-seat	5		spur	16½–1	springs.
Walker	K	1	96	solid	34x3½	36x4	35	amid-u	opt						unit-x-1	West.	3	60	14		u-seat	5		spur	16½–1	springs.
Walker	L	2	112	solid	38x4	38x6	36	amid-u	opt						unit-x-1	West.		60	13	12	u-seat	5		spur	16 1/7-1	springs.
Walker	P	3½	131	solid	36x5	36x5d	40	amid-u	opt						1	West.	6½	60	12	11	u-seat	5		spur	18 1/6-1	springs.
Walker	N	5	141	solid	36x6	38x6d	40	amid-u							unit-x-1	West.	6½	60	11	10	u-seat	5		spur	18 1/6-1	springs.
Ward	WS-2	¾	88	solid	32x3	32x3½	29	amid-o	opt						amid-1	GEW				11–13	chas-f	4		worm		springs.
Ward	WA-2	¾	90	solid	32x3½	34x4	33½	amid-o	opt						amid-1	GEW				10–12	chas-f	4		worm		springs.
Ward	WA	¾	90	solid	32x3½	34x4	33½	amid-u	opt						front-e-1	GEW				10–12	u-seat	4		worm		springs.
Ward	WB	1	102	solid	34x4	36x5	34½	front-u	opt						front-e-1	GEW				9–10½	u-seat	4		worm		springs.
Ward	WM	1–1½	88	solid	32x3	32x4	30	amid-o	opt						amid-1	G.E.				10–12	chas-f	4		worm		springs.
Ward	WD	2	114	solid	36x5	36x7	38	amid-u	opt						front-e-1	GEW				8-9	u-seat	4		worm		springs.
Ward	WF	3½	132	solid	36x6	36x10	40½	amid-u	opt						front-e-1	GEW				7-8	u-seat	5		worm		springs.
Ward	WH	5	146	solid	36x7	40x12	44	amid-u	opt						front-e-1	GEW				6-7	u-seat	5		worm		springs.

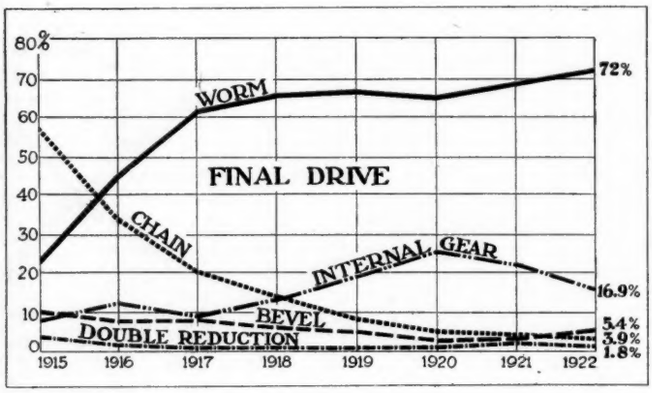
ABBREVIATIONS—Types of Construction and Parts Makers

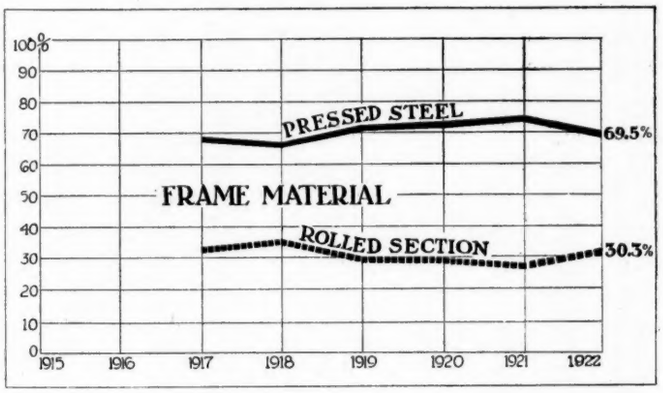
*with other options
†torque taken by springs in all vehicles listed, other options in case of C. T. make
amid-o—amidships, over frame
amid-u—amidships, underslung below frame
chas-f—in chassis front
d—dual
Ex—Exide
front-c—front center
front-u—in front, under frame
G. E.—General Electric
GEW—General Electric—Westinghouse
her—herringbone gear
int-g—internal gear
opt—optional
pneu—pneumatic
rad-rd—radius rod
rol-ch—roller chain
st-col—on steering column
unit-j—unit jackshaft
unit-x—unit with axle
u-seat—under seat
West—Westinghouse

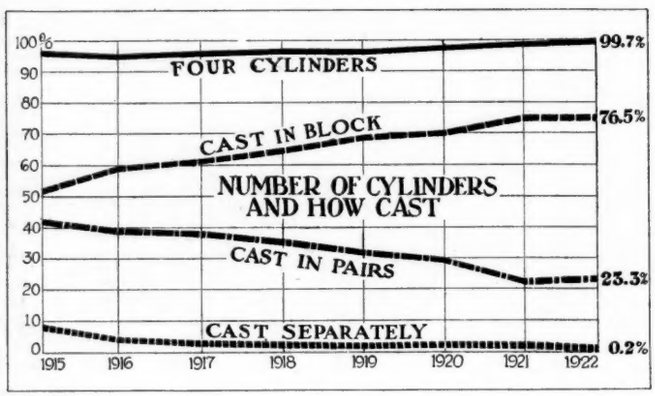
Tendencies in American Truck Design

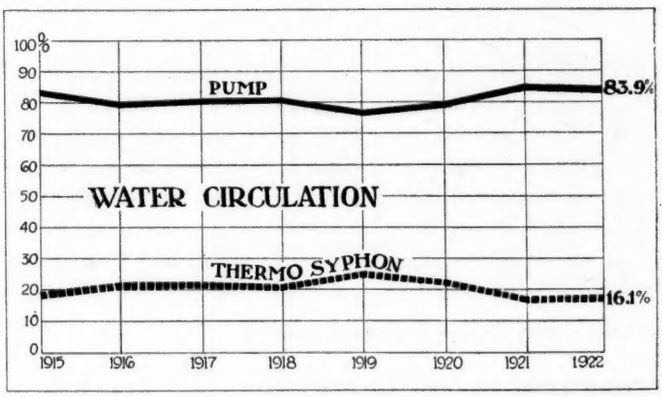


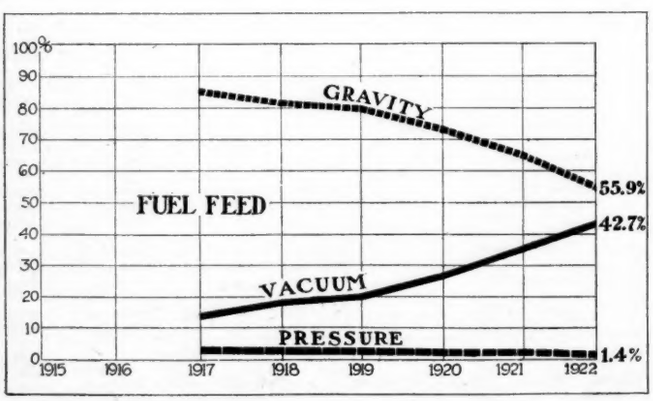


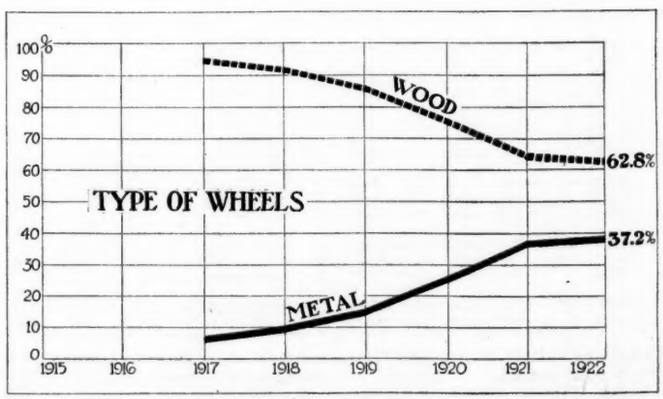












See page 349 for discussion of trends in American truck designs

Tendencies in British Truck Design For 1922

Chassis for useful loads of 7,000 to 10,000 still the main product of the industry. Worm drive increasing in popularity, but no British trucks have internal gear drive on wheels. Straight-sided piston almost universal.

By M. W. Bourdon

FROM the earliest days British truck manufacturers in general showed a tendency to give more attention to the type of chassis carrying 3 to 3½ tons (say, 6700 to 7500 lb.) of useful load, and this type still predominates among British products of this nature, though in a number of cases it has been strengthened so as to deal with loads up to 10,000 lb.; nearly 50 per cent of the models of all makers come, in fact, within this enlarged range. The next in importance, so far as number of models is concerned, is the chassis designed for 4500 to 5500 lb. load.

The light delivery van chassis carrying loads of from 2000 to 3500 lb. has received scant attention, though for 1922 there is a decided increase in the number of models of this size available to purchasers.

There is a tendency to design chassis for heavier load units than hitherto and approximately 16 per cent of British trucks are offered for loads running from 11,000 to 16,000 lb.

The tendency to cater for heavier individual loads on gasoline trucks is accounted for by an endeavor on the part of the makers to invade a field hitherto held almost exclusively by steam trucks. Whether they will, in this sphere, be able to make headway against the steamer remains to be seen.

As the accompanying specification table shows, the four-cylinder engine is practically universal on British trucks.

There is no general tendency on the part of makers to depart from the pair-cast cylinder arrangement, which occurs in 76 per cent of engines.

L-head cylinders continue to predominate and percentages for 1922 show no tendency toward the adoption of overhead valves. On the other hand, those makers who in the past have favored the T-head arrangement continue to do so in one or two instances.

There is no general practice in regard to camshaft drive. The skew pinion leads with 42 per cent, but the silent chain is also widely used (32 per cent) and in 23 per cent of chassis straight-toothed pinions occur in the distribution. Where overhead valves are used the push-rod system of operation is generally favored, Maudslay being the only maker employing an overhead camshaft, a feature which has always characterized this make of truck.

A pump for water circulation occurs on 85 per cent of engines, but in 18 per cent of these it is driven by belt, the pump casing in most instances being located on, or integral with, the front of the cylinder water jacket, the pump shaft being a prolongation of the fan shaft.

Gilled tube radiators with vertical tubes and a cast aluminum casing very largely predominate, this arrangement serving on 90 per cent of trucks.

Seventy-six per cent of engines which are mounted directly in the main frame have a 3-point suspension system, though rarely, indeed, is there any degree of flexibility in the points of attachment. On the other hand, when a sub-frame occurs it has a 4-point support in 65 per cent of chassis and the engine is supported upon it, also at four points.

In connection with pistons, aluminum is only used in 7 per cent of engines, the straight-sided type is almost universal for either cast iron or aluminum, and three compression rings occur in 79 per cent of engines.

For engine lubrication the pressure system embodying a drilled crankshaft is most in favor, though 25 per cent of engines have pressure lubrication for the main journals only, the big-ends and other parts depending upon splash from troughs. Troughs alone serve for 21 per cent of engines, while only 4.5 per cent have a full pressure system, which includes a lead to the small end of the connecting rods. The gear type of oil pump is almost universal, very few examples of the plunger pattern being observable.

Magneto ignition is also almost universal, and would be so but for the fact that one touring car maker offers a commercial vehicle with battery ignition. Twelve months ago there was a slight tendency toward fitting an impulse starter with magneto ignition on some of the larger types of engines, but at the present time there are only 6 per cent of British trucks so equipped, and on 73 per cent of chassis the makers positively refuse to fit it, even at an extra cost.

Last year the makers of 40 per cent of British trucks refused to fit electric lighting, but this percentage is now reduced to 6, though only on 4 per cent of models is it included, except as an extra. No British truck has an electric starter as standard, and on 65 per cent the makers refuse to fit one, there being no provision for the motor or its transmission.

In regard to transmission details, the cone clutch in one form or another accounts for 76 per cent of chassis, the dry, single-plate type having advanced in favor only from 19 to 22 per cent since last year.

The gearset is arranged as a unit with the engine in only 5 per cent of trucks.

Worm drive has increased in popularity to the extent of 5 per cent since last year, 57 per cent of British trucks now having this form of transmission. Next in favor is the double chain (22.5 per cent), this being followed by a double-reduction system of bevel and spur pinion.

Only 13 per cent of trucks have both brakes on the rear wheels. This actually represents a 10 per cent reduction since last year, which is accounted for by the larger number of new models with brakes on transmission and wheels.

British Truck Chassis

NAME	Net Load Capacity Lb.	No. of Cyls. Bore and Stroke Ins.	Normal R.P.M.	Cyls. Heads	Cyls. Cast	Valve Arrangement	Camshaft Drive	Water Circulation	Water Pump Drive	RADIATOR Type	RADIATOR Casing Material	PISTONS Engine Mounting	PISTONS No. of Rings	PISTONS Scraper Ring	Wrist Pin Fixing	Engine Lubrication	Carburetter Make	Governor Fitted	IGNITION Type	IGNITION Timing	Impulse Starter	Fuel Feed	Tank Location
A.E.C.	7800	4-4¼x5½	1000	Int.	Pairs.	L	Chain	Pump	Belt	Tub	Alum.	3 Pt.	4	Yes	Rod	Sp. & P.	Zenith	No	Mag.	Fixed.	No	Grav.	Seat
A.E.C.	9000	4-4¾x5⅞	1000	Int.	Pairs.	L	Chain	Pump	Belt	Tub	Alum.	3 Pt.	4	Yes	Rod	Sp. & P.	Zenith	Yes	Mag.	Var.	Yes	Press.	Rear
Albion[1]	2800	4-3½x5	1100	Det.	Block	L	Skew	Pump	Belt	Tub	Alum.	3 Pt.	3	No	Bosses		Zenith	Yes	Mag.	Var.	No	Grav.	Dash
Albion[2]	5600	4-4½x5	1100	Int.	Block	L	Str Pin	Pump	Belt	Tub	Alum.	3 Pt.	3	No	Bosses		Zenith	Yes	Mag.	Var.	No	Grav.	Dash
Albion	9000	4-4½x5	1100	Int.	Block	L	Str Pin	Pump	Belt	Tub	Alum.	3 Pt.	3	No	Bosses		Zenith	Yes	Mag.	Var.	No	Grav.	Dash
Austin	3350	4-3¾x5	1000	Det.	Block	L	Chain	Pump	Pos	Tub	Alum.	3 Pt.	3	Yes	Rod	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Dash
Beardmore	1700	4-3⅛x4¾	1200	Det.	Block	L	Chain	Pump	Belt	Tub	Sheet	4 Pt.	3		Bosses	H.C.S.	Zenith	No	Mag.	Fixed.	Ex	Grav.	Seat
Belsize	1350	4-3½x4⅝	1000	Int.	Block	L	Chain	Pump	Pos	Cell		3 Pt.	3	No	Bosses	H.C.S.	Zenith	No	Mag.	Fixed.	No	Vac.	Seat
Bristol	7800	4-4½x5¾	1400	Int.	Pairs.	L	Chain	Ther.		Tub	Alum.	3 Pt.	3	No	Rod	Spl.	Claudel	Yes	Mag.	Var.	No	Opt.	Opt
Churchill	7800	4-5 x6	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	4	Yes	Rod	H.C.S.	Claudel	No	Mag.	Var.	No	Press.	Seat
Caledon[3]	9000	4-4⅝x5½	1000	Det.	Pairs.	Sl.	Chain	Pump	Pos	Tub	Alum.	3 Pt.	3	No	Rod	H.C.S.	Claudel	Opt	Mag.	Var.	Yes	Grav.	Seat
Commer	4500	4-4 x4¾	1200	Int.	Pairs.	L	Str Pin	Ther.		Tub	Alum.	3 Pt.	3	No	Bosses	Spl.	Claudel	No	Mag.	Var.	No	Grav.	Seat
Commer	6700	4-4½x5½	1000	Int.	Pairs.	L	Str Pin	Ther.		Tub	Alum.	3 Pt.	3	No	Bosses	Spl.	Claudel	No	Mag.	Var.	No	Grav.	Seat
Commer	9000	4-4⅝x5½	1000	Int.	Pairs.	L	Str Pin	Ther.		Tub	Alum.	3 Pt.	3	No	Bosses	Spl.	Claudel	No	Mag.	Var.	No	Grav.	Seat
Commer	12000	4-4¾x5½	1000	Int.	Pairs.	L	Str Pin	Ther.		Tub	Alum.	3 Pt.	3	No	Bosses	Spl.	Claudel	No	Mag.	Var.	No	Grav.	Seat
Cubitt	1700	4-3⅛x5½	1800	Det.	Block	L	Str Pin	Ther.		Cel	Sheet	4 Pt.	3	Yes	Float	H.C.S.	Smith	No	Batt.	Var.	No	Grav.	Dash
Daimler	4500	4-3¾x5½	1100	Det.	Pairs.	Sl.	Chain	Pump	Pos	Tub	Alum.	3 Pt.	3	No	Bosses	Sp. & P.	Zenith	No	Mag.	Fixed.	No	Grav.	Seat
Dennis	4500	4-4⅛x5⅞	1000	Int.	Pairs.	T	Str Pin	Pump	Pos	Tub	Alum.	4 Pt.	3	Yes	Bosses	Sp. & P.	Claudel	No	Mag.	Var.	No	Grav.	Seat
Dennis	7800	4-4½x3⅞	1000	Int.	Pairs.	T	Str Pin	Pump	Pos	Tub	Alum.	4 Pt.	3	Yes	Bosses	Sp. & P.	Claudel	No	Mag.	Var.	No	Grav.	Seat
Dennis	12000	4-4½x5⅞	1000	Int.	Pairs.	T	Str Pin	Pump	Pos	Tub	Alum.	4 Pt.	3	Yes	Bosses	Sp. & P.	Claudel	No	Mag.	Var.	No	Grav.	Seat
Enfield-Allday	3350	4-4 x5⅛	1100	Int.	Pairs.	T	Str Pin	Ther.		Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Seat
Guy	2800	4-3¼x4½	1400	Det.	Block	L		Ther.		Tub	Alum.	3 Pt.	3	No	Float	Spl.		No	Mag.	Var.	No	Grav.	Dash
Guy	4500	4-4 x5½	1000	Det.	Block	L	Chain	Ther.		Tub	Alum.	4 Pt.	3	Yes	Float	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Dash
Guy	6700	4-4 x5½	1000	Det.	Block	L	Chain	Pump	Pos	Tub	Alum.	4 Pt.	3	Yes	Float	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Dash
Halley	4500	4-4 x5¼	1000	Int.	Pairs.	L	Skew	Ther.		Tub	C.I.	4 Pt.	4	Yes	Bosses	Sp. & P.	Zenith	Yes	Mag.	Var.	Ex	Grav.	Seat
Halley	7800	6-3½x6	1200	Det.	Three.	L	Chain	Pump	Pos	Tub	Alum.	4 Pt.	4	Yes	Float	Spl.	Zenith	No	Mag.	Var.	Ex	Grav.	Seat
Halley	12000	4-5 x6½	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	4	Yes	Bosses	Sp. & P.	Zenith	Yes	Mag.	Var.	Ex	Grav.	Seat
Hallford	4000	4-3⅝x5½	1000	Int.	Pairs.	T	Str Pin	Pump	Pos	Tub	Alum.	3 Pt.	4	No	Bosses	Spl.	Zenith	Yes	Mag.	Var.	No	Grav.	Seat
Hallford	5600	4-4⅛x5½	1000	Int.	Pairs.	T	Str Pin	Pump	Pos	Tub	Alum.	3 Pt.	4	No	Bosses	Spl.	Zenith	Yes	Mag.	Var.	No	Grav.	Seat
Hallford	8000	4-4½x5½	1000	Int.	Pairs.	T	Skew	Pump	Pos	Tub	Alum.	4 Pt.	4	Yes	Bosses	Sp. & P.	Zenith	Yes	Mag.	Var.	No	Grav.	Seat
Hallford	11000	4-4¾x5½	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	4	Yes	Bosses	Sp. & P.	Zenith	Yes	Mag.	Var.	No	Grav.	Seat
Karrier[4]	6700	4-5 x6	1060	Int.	Pairs.	L	Chain	Pump	Pos	Tub	Alum.	3 Pt.	3	No	Bosses	Spl.	Zenith	No	Mag.	Var.	Ex	Grav.	Seat
Leyland[5]	4500	4-4½x5	850	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Claudel	Opt	Mag.	Var.	No	Grav.	Seat
Leyland[6]	9000	4-4⅝x6	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Claudel	Opt	Mag.	Var.	No	Grav.	Seat
Leyland	11000	4-5 x6	1150	Int.	Pairs.	L	Skew	Pump	Pos	Cell	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Claudel	Opt	Mag.	Var.	No	Grav.	Seat
Marathon	4500	4-3⅛x5⅛	1500	Det.	Block	L	Skew	Pump	Belt	Tub	Alum.	3 Pt.	3	Yes	Bosses	Sp. & P.	Zenith	No	Mag.	Var.	Ex	Grav.	Seat
Maudslay	6700	4-4½x5	1000	Int.	Pairs.	I	Skew	Pump	Belt	Tub	Alum.	4 Pt.	4	Yes	Bosses	Press	Zenith	No	Mag.	Var.	No	Vac.	Dash
Maudslay	10100	4-5 x5	1000	Int.	Pairs.	I	Skew	Pump	Belt	Tub	Alum.	4 Pt.	4	Yes	Bosses	Press	Zenith	No	Mag.	Var.	No	Vac.	Dash
Maudslay	13500	4-4¾x6	1000	Det.	Block	I	Bevels	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	Press	Zenith	No	Mag.	Var.	No	Vac.	Side
McCurd	9000	4-4½x5½	600	Int.	Pairs.	T	Worm	Pump	Pos	Tub	Alum.	3 Pt.	4	Yes	Bosses	Spl.	Zenith	No	Mag.	Var.	Ex	Grav.	Seat
Pagefield[7]	6700	4-4¾x5½	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Zenith	Yes	Mag.	Var.	No	Grav.	Seat
Pagefield[8]	9000	4-4¾x5½	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Zenith	Yes	Mag.	Var.	No	Grav.	Seat
Palladium	7800	4-4½x5½	1250	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	3 Pt.	3	Yes	Bosses	Sp. & P.	Zenith	No	Mag.	Var.	Yes	Grav.	Seat
Scammell	22000	4-5 x5½	1200	Det.	Pairs.	I	Skew	Pump	Pos	Tub	Alum.	3 Pt.	3	Yes	Float	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Dash
Star	3350	4-3½x5⅞	1000	Int.	Pairs.	L	Chain	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Seat
Star	5600	4-3½x5⅞	1000	Int.	Pairs.	L	Chain	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Seat
Star	6700	4-4 x5⅞	1000	Det.	Block	L	Str Pin	Pump	Pos	Tub	Alum.	4 Pt.	3	No	Bosses	H.C.S.	Zenith	No	Mag.	Var.	No	Grav.	Seat
Straker-Squire	11000	4-4½x6½	1000	Det.	Block	I	Chain	Pump	Belt	Tub	Alum.	4 Pt.	3		Conrod.	Special		Yes	Mag.	Var.		Grav.	Dash
Thornycroft	4500	4-4 x5½	1000	Det.	Block	F	Skew	Pump	Belt	Tub	Alum.	4 Pt.	2	Yes	Float	H.C.S.	Solex	Yes	Mag.	Var.	No	Grav.	Dash
Thornycroft[9]	6700	4-4½x6	1000	Int.	Pairs.	T	Skew	Pump	Belt	Tub	Alum.	3 Pt.	3	Yes	Float	H.C.S.	Solex	Yes	Mag.	Var.	No	Grav.	Dash
Thornycroft	11000	4-4½x6	1000	Int.	Pairs.	T	Skew	Pump	Belt	Tub	Alum.	3 Pt.	3	Yes	Float	H.C.S.	Solex	Yes	Mag.	Var.	No	Grav.	Dash
Tilling-Stevens	5600	4-4⅛x4⅝	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	3	Yes	Bosses	Sp. & P.	Zenith	Opt	Mag.	Fixed.	Ex	Grav.	Seat
Tilling-Stevens[10]	9000	4-5 x6	1000	Int.	Pairs.	L	Chain	Pump	Pos	Tub	Alum.	4 Pt.	3	Yes	Bosses	Sp. & P.	Zenith	Opt	Mag.	Fixed.	Ex	Grav.	Seat
Tilling-Stevens	4500	4-4⅛x4⅝	1000	Int.	Pairs.	L	Skew	Pump	Pos	Tub	Alum.	4 Pt.	3	Yes	Bosses	Sp. & P.	Zenith	Opt	Mag.	Fixed.	Ex	Grav.	Seat
Vulcan	3350	4-3½x4¾	1200	Int.	Block	L	Skew	Pump	Pos	Tub	Alum.	3 Pt.	3	No	Bosses	Spl.	Zenith	Opt	Mag.	Var.	No	Grav.	Dash

For abbreviations, see pages 340 and 341.

[1]This same chassis is also built with a 3-in. longer wheel base and a rolled frame and is then rated at 3350 lbs. carrying capacity.
[2]Made also with a 6-in. longer wheelbase and then rated at 6700 lbs.
[3]Rated at 16,000 lbs. when fitted with double chain drive and greater reduction ratio.
[4]Rated at 9000 lbs. with an 8.23 reduction and at 11,000 lbs. with an 8.9 reduction.
[5]Specifications of 6700 lbs. model the same except that gear ratio is 7.25 and wheelbase 157 in.
[6]Specifications of 1300 lbs. model the same except that wheelbase is 9 in. longer.

Percentages of Design Features in British Trucks, 1922

Cylinder Heads
Integral .....73 per cent
Detachable .....27 per cent

Valve Arrangement
L .....70 per cent
T .....16.5 per cent
I ..... 7.5 per cent
Single Sleeve ..... 4.5 per cent
F ..... 1.5 per cent

Camshaft Drive
Skew pinions .....42 per cent
Chain .....32 per cent
Straight pinions .....23 per cent
Worm gear .....1.5 per cent
Bevels .....1.5 per cent

Water Circulation
Pump .....85 per cent
Thermo .....15 per cent

Water Pump Drive
Positive .....72 per cent
Belt .....18 per cent

Radiator; Type
Gilled tubes .....87 per cent
Plain tubes ..... 7 per cent
Cellular ..... 6 per cent

Tubular; Hor. or Vert.
Vert .....93 per cent
Hor. ..... 7 per cent

Casing Material
Cast aluminum .....95 per cent
Sheet metal ..... 3 per cent
Cast iron ..... 2 per cent

Engine Mounting
In sub frame .....51 per cent
In main frame .....49 per cent

Specifications for 1922

CLUTCH		GEAR SET			PROPELLER SHAFT					BRAKES				SPRINGS		WHEELS						
					Type of Joints					Hand		Pedal										
Type	Friction Surface	Location	No. of Speeds	Position of Lever	Front	Rear	Final Drive	Drive Trans. by	Torque Taken by	Type	Location	Type	Location	Front	Rear	Type	Standard Tyres	Back A le Gear Ratio	Wheel Base Inches	Track Inches	Type of Frame	NAME
Dry Pl.	Fab...	Sep...	3or4	Right	Star...	Star...	Worm..	Sprgs...	T. Arm.	Int...	Wh...	Int....	Wh.....	½ Ell.	½Ell.	W.c.s.	Solid..	.....	170	70	Flitch...	A.E.C.
Dry Pl.	Fab...	Sep...	4	Right	Star...	Star...	Worm..	Sprgs...	T. Arm.	Int...	Wh...	Int....	Wh.....	½ Ell.	½ Ell.	W.s...	Solid..	Opt...	170	68	Pressed..	A.E.C.
Dry Pl.	Fab...	Sep...	3	Right	Star...	Star...	Worm..	Sprgs...	Sprgs..	Int...	Wh...	Ext..	G. Set.	½ Ell.	½ Ell.	Opt...	Opt...	.....	129	61	Pressed..	Albion[1]
Dry Pl.	Fab...	Sep...	3	Right	.....	.....	Chain..	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	S.c.s...	Solid..	.....	157	70	Rolled...	Albion[2]
Dry Pl.	Fab...	Sep...	3	Right	.....	.....	Chain..	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	S.c.s...	Solid..	.....	173	70	Rolled...	Albion.
Dry Pl.	Fab...	Unit..	4	Cent..	Pot...	Pot...	Worm.	Sprgs...	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.s.c.	Solid..	8.6	126	60	Pressed..	Austin
Cone...	Fab...	Sep...	4	Right	Fab...	Fab...	Beb...	Sprgs...	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	¾ Ell.	Wood.	Pneu..	4.64	100	54	Pressed	Beardmore
Cone...	Fab...	Unit..	4	Right	Lea...	Lea...	S.P.Bev	Sprgs...	Sprgs..	Int...	Wh...	Int....	Wh.....	½ Ell.	½ Ell.	H.p.s..	Pneu..	4	99	56	Pressed	Belsize
Dry Pl.	Fab...	Sep...	4	Cent..	Lea...	Lea...	Worm.	Sprgs...	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	Opt...	170	70	Pressed..	Bristol
Cone...	M.-M...	Sep...	4	Right	.....	.....	Chain..	R. Rod.	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	Wood.	Solid..	.....	180	65	Rolled...	Churchill
Cone...	Fab...	Sep...	4	Right	Star...	Pot...	Worm.	Sprgs...	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	8	171	66	Pressed..	Caledon[3]
Cone...	Lea....	Sep...	3	Right	Int...	C. Pin.	Worm.	P.s.c....	P.s.c....	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	7.33	144	66	Pressed.	Commer.
Cone...	Lea....	Sep...	4	Right	C. Pin.	C. Pin.	Worm.	Sprgs...	Sprgs..	Ext...	G. Set.	Int...	Wh...	½ Ell.	½ Ell.	H.c.s.	Solid..	7.66	165	68	Rolled..	Commer
Cone...	Lea....	Sep...	3	Right	.....	.....	Chain..	R. Rod.	T. Rod.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	7.5	165	68	Rolled.	Commer
Cone...	Lea....	Sep...	4	Right	.....	.....	Chain..	R. Rod.	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	9.3	162	72	Rolled..	Commer
Cone...	Fab...	Sep...	4	Right	Fab...	Fab...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	Wh.....	½ Ell.	½ Ell.	H.p.s.	Pneu.	4.12	126	54	Pressed..	Cubitt
Cone...	Fab...	Sep...	4	Right	Star...	Star...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Int...	Wh.....	½ Ell.	½ Ell.	W.c.s.	Solid..	7.25	138	63	Flitch...	Daimler
Dry Pl.	Fab...	Sep...	4	Cent..	Star...	Star...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	6.75	144	62	Pressed.	Dennis
Cone...	Fab...	Sep...	4	Right	Star...	.....	Worm.	P.s.c....	P.c.s....	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	7.75	156	66	Pressed..	Dennis
Cone...	Fab...	Sep...	4	Right	Star...	.....	Worm.	P.s.c....	P.s.c....	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	8.75	170	66	Pressed..	Dennis
Cone...	Fab...	Sep...	3	Right	.....	.....	Chain..	C. Case	C. Case	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	Disk.	Solid..	.....	147	66	Pressed..	Enfield-Allday
Dry Pl.	Fab...	Unit..	3	Cent..	Star...	Fab...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Int...	Wh.....	½ Ell.	½ Ell.	H.c.s.	Opt...	.....	112	56	Pressed..	Guy
Cone...	Fab...	Sep...	4	Right	Fab...	Fab...	B.&S..	Sprgs..	Sprgs..	Int...	Wh...	Int...	F.d.s..	½ Ell.	½ Ell.	S.c.s..	Solid..	6.33	148	60	Pressed..	Guy
Cone...	Fab...	Sep...	4	Right	Star...	Pot....	B.&S..	Sprgs..	Sprgs..	Int...	Wh...	Int...	F.d.s..	½ Ell.	½ Ell.	H.c.s.	Solid..	6.8	148	60	Pressed..	Guy
Cone...	Lea....	Sep...	3	Right	.....	.....	Chain..	R. Rod.	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.c.s.	Solid..	.....	.....	.....	Rolled...	Halley
Dry Pl.	Fab...	Sep...	4	Right	Fab...	Fab...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	F.d.s..	½ Ell.	½ Ell.	H.c.s.	Solid..	7.66	160	62	Rolled..	Halley
Dry Pl.	Fab...	Sep...	4	Right	.....	.....	Chain..	R. Rod.	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.c.s.	Solid..	.....	169	66	Rolled...	Halley
Cone...	Fab...	Sep...	3	Right	.....	.....	Chain..	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	S.c.s..	Solid..	.....	130	62	Pressed..	Hallford
Cone...	Fab...	Sep...	3	Right	.....	.....	Chain..	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	S.c.s..	Solid..	.....	148	64	Pressed..	Hallford
Cone...	Fab...	Sep...	4	Right	.....	.....	Chain..	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	S.c.s..	Solid..	.....	162	72	Pressed..	Hallford
Cone...	Fab...	Sep...	4	Right	.....	.....	Chain..	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	S.c.s..	Solid..	.....	180	72	Pressed..	Hallford
Cone...	Lea....	Sep...	4	Right	C. Pin.	Pot...	B.&S..	P.s.c....	P.s.c....	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	6.65	168	66	Pressed..	Karrier[4]
Cone...	Fab...	Sep...	4	Right	Pot...	Pot...	Worm.	P.s.c....	P.s.c....	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	7	141	65	Pressed	Leyland[5]
Cone...	Fab...	Sep...	4	Right	Pot...	Pot...	B.&S..	P.s.c....	P.s.c....	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	7.86	168	65	Pressed	Leyland[6]
Cone...	Fab...	Sep...	4	Right	Pot...	Pot...	B.&S..	P.s.c....	P.s.c....	Int....	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	8.9	181	65	Pressed..	Leyland
Cone...	Fab...	Sep...	4	Right	Fab...	Fab...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	F.d.s..	½ Ell.	½ Ell.	H.c.s.	Solid..	6.75	126	58	Pressed..	Marathon
Cone...	Lea....	Sep...	4[1]	Right	Star...	Pot...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	7.75	162	66	Rolled...	Maudslay
Cone...	Lea....	Sep...	4[1]	Right	Star...	Pot...	B.&S..	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	8.25	174	66	Rolled...	Maudslay
Cone...	Lea....	Sep...	4[1]	Cent..	Star...	Pot...	B.&S..	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	Disk.	Solid..	8.25	186	66	Rolled...	Maudslay
Cone...	Lea....	Sep...	4[1]	Right	Star...	Star...	Worm.	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.c.s.	Solid..	7.1	174	66	Pressed..	McCurd
Cone...	Fab...	Sep...	4	Right	Star...	Pot...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	Disk.	Solid..	.....	174	69	Pressed..	Pagefield[7]
Cone...	Fab...	Sep...	4	Right	Star...	Pot...	B.&S..	T. Arm.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.c.s.	Solid..	.....	164	69	Pressed..	Pagefield[8]
Dry M.	Fab...	Sep...	4	Right	Star...	Star...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	Cant.	H.c.s.	Solid..	7.8	176	68	Pressed..	Palladium
Cone...	Fab...	Sep...	3	Right	.....	.....	Chain..	R. Rod.	Sprgs..	Int...	Wh...	Ext...	G.S et	½ Ell.	½ Ell.	W.c.s.	Solid..	.....	120	64	Pressed..	Scammell
Cone...	Fab...	Sep...	4	Right	Pot...	Pot...	Worm.	Sprgs..	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	Disk.	Solid..	5	138	57	Pressed..	Star
Cone...	Fab...	Sep...	4	Right	Pot...	Pot...	Worm.	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	Disk.	Solid..	6.8	150	60	Pressed..	Star
Cone...	Fab...	Sep...	4	Right	Star...	Pot...	Worm.	R. Rod.	T. Arm.	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	H.c.s.	Solid..	6.8	150	60	Pressed..	Star
Dry Pl.	Fab...	Sep...	4	Right	Star...	Star...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Int...	Wh.....	½ Ell.	½ Ell.	H.c.s.	Solid..	7 or 8	174	72	Pressed..	Straker-Squire
Cone...	Fab...	Sep...	3	Cent..	Lea...	Lea...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.c.s.	Solid..	7.25	144	62	Pressed..	Thornycroft
Cone...	Fab...	Sep...	4	Right	Lea...	Lea...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.c.s.	Solid..	7.25	156	67	Pressed..	Thornycroft[9]
Cone...	Fab...	Sep...	4	Right	L.Ring	Lea...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	W.s.c.	Solid..	10.6	169	71	Pressed..	Thornycroft
Cone...	Fab...	Sep...	4	Right	C. Pin.	Star...	Worm.	Sprgs..	Sprgs..	Ext...	Wh...	Int...	Wh.....	½ Ell.	½ Ell.	H.c.s.	Solid..	6	144	57	Pressed..	Tilling-Stevens
Cone...	Fab...	Sep...	4	Right	Star...	C. Pin.	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Int...	Wh.....	½ Ell.	½ Ell.	H.c.s.	Solid..	6.5	174	68	Pressed..	Tilling-Stevens[10]
.....	.....	.....	.....	.....	Star...	C. Pin.	Worm.	Sprgs..	Sprgs..	Ext...	Wh...	Int...	Wh.....	½ Ell.	½ Ell.	H.c.s.	Solid..	10.3	144	57	Pressed..	Tilling-Stevens
Cone...	Fab...	Sep...	4	Cent..	C. Pin.	Pot...	Worm.	Sprgs..	Sprgs..	Int...	Wh...	Ext...	G. Set..	½ Ell.	½ Ell.	S.c.s..	Solid..	6.2	137	56	Pressed..	Vulcan

For abbreviations, see pages 340 and 341.

[7]Also made as a tractor of 98 in. wheelbase and with a load rating of 7800 lbs.

[8]Made also with worm drive (Hotchkiss), disk wheels and 177 in. wheelbase.

[9]Specifications of 9000 lbs. model the same except 8.25 gear reduction and 163 in. wheelbase.

[10]Also made with a 10.3 gear reduction and with this reduction and an engine with 4¾-in. bore.

In Main Frame

3 point .....76 per cent
4 point .....24 per cent

In Sub Frame

4 point .....82 per cent
3 point .....18 per cent

Sub Frame Support

4 point .....65 per cent
3 point .....35 per cent

PISTONS

Material

Cast iron .....93 per cent
Aluminum ..... 7 per cent

Type

Straight side .....91 per cent
Hour glass ..... 9 per cent

Number of Rings

3 .....79 per cent
4 .....19 per cent
2 ..... 2 per cent

Scraper Ring

Not fitted .....54 per cent
Fitted .....46 per cent

Wrist Pin Fixing

In bosses .....73 per cent
Floating .....15 per cent
In connecting rod .....12 per cent

Engine Lubrication

Pressure .....40 per cent
Trough and pressure .....25 per cent
Trough .....21 per cent
Miscellaneous .....9.5 per cent
Full pressure .....4.5 per cent

Carbureter Make

Zenith .....67.5 per cent
Claudel .....24.5 per cent
Solex ..... 6.0 per cent
Smith ..... 2.0 per cent

Governor Fitted?

No .....47.5 per cent
Yes .....33.0 per cent
Optional .....19.5 per cent

(*Continued on page* 366)

Continental Commercial Vehicle

NAME and NATIONALITY	Rated Capacity (Tons)	Wheelbase (In.)	Track (In.)	No. Cyls. Bore and Stroke (Mm.)	Cylinder Arrangement	Valve Location	Cylinder Head	Lubrication System	Water Circulation	Electric Starter	Governor	Clutch	No. Forward Speeds	Final Drive	Propeller Shaft	BRAKES Type and Location: Location	Foot	Hand	Type of Wheels	TIRES Size in Millimeters: Kind	Front	Rear
FRENCH																						
Ariès	4	162	66	4- 90x150	Blk.	L.	Fix.	Pres.	T.	None.	Yes.	Dsk.	4	Chn.	.	Tr.	Ext.	R. Ext.	C. Sol.	S.	1000x130	1000x130
Ariès	5	162	66	4-100x150	Blk.	L.	Fix.	Pres.	T.	None.	Yes.	Dsk.	4	Chn.	.	Tr.	Ext.	R. Ext.	C. St.	S.	1000x130	970x160
Berliet	¾	123	56	4- 90x130	Blk.	L.	Det.	Circ.	P.	Yes.	No.	Dsk.	3	S. B.	E.	R.	Int.	R. Int.	Disk.	P.	880x120	880x120
Berliet	1½	138	56	4- 90x130	Blk.	L.	Det.	Circ.	P.	Yes.	No.	Dsk.	3	Wrm.	O.	R.	Int.	R. Int.	Disk.	P.	895x135	895x135
Berliet	2½	150	70	4-110x140	Prs.	L.	Fix.	Pres.	P.	None.	Yes.	Pla.	4	D. R.	E.	Tr.	Ext.	R. Int.	Disk.	P.	955x155	955x155
Berliet	3	144	70	4-110x140	Prs.	L.	Fix.	Pres.	T.	None.	Yes.	Pla.	4	Wrm.	O.	R.	Int.	R. Int.	Disk.	P.	955x155	955x155
Berliet	5	165	70	4-110x140	Prs.	L.	Fix.	Pres.	T.	None.	Yes.	Pla.	4	Chn.	.	Tr.	Ext.	R. Int.	C. St.	S.	950x140	1030x160
Brasier	1¾	133	56	4- 85x150	Blk.	L.	Fix.	Circ.	T.	Opt.	None.	Con.	4	Bev.	O.	Tr.	Ext.	R. Int.	Disk.	P.	880x180	880x120
Brasier	3½	150	67	4-100x150	Blk.	L.	Fix.	Circ.	P.	None.	Yes.	Con.	4	Chn.	.	Tr.	Ext.	R. Int.	Disk.	S.	955x155	955x155
Brasier	5	165	67	4-100x150	Blk.	L.	Fix.	Circ.	P.	None.	Yes.	Con.	4	Chn.	.	Tr.	Ext.	R. Int.	Steel.	S.	1000x120	970x160
Cottin-Desgouttes	1½	138	55	4- 80x160	Blk.	L.	Det.	Pres.	P.	None.	No.	Con.	4	D. R.	O.	Tr.	Ext.	R. Int.	Disk.	P.	935x135	935x135
Cottin-Desgouttes	2	138	55	4- 90x160	Blk.	L.	Det.	Pres.	P.	None.	No.	Con.	4	D. R.	O.	Tr.	Ext.	R. Int.	Disk.	P.	935x135	935x135
De Dion Bouton	2	149	63	4- 90x140	Blk.	L.	Fix.	Pres.	P.	Opt.	None.	Pla.	4	I. G.	O.	Tr.	Ext.	R. Int.	Disk.	P.	895x135	893x135
De Dion Bouton	3½	162	63	4-100x140	Prs.	L.	Fix.	Pres.	P.	None.	Yes.	Pla.	4	I. G.	O.	Tr.	Ext.	R. Int.	Stl.	S.	930x120	930x120
De Dion Bouton	5	169	63	4-110x150	Prs.	L.	Fix.	Pres.	P.	None.	Yes.	Pla.	4	I. G.	O.	Tr.	Ext.	R. Int.	Stl.	S.	950x140	1030x160
Delahaye	1½	146	60	4- 85x130	Blk.	L.	Fix.	Pres.	P.	Opt.	No.	Con.	4	Bev.	O.	Tr.	Ext.	R. Int.	Disk.	P.	895x135	895x135
Delahaye	4	162	66	4-100x160	Blk.	L.	Fix.	Pres.	P.	Opt.	Yes.	Con.	4	Chn.	.	Tr.	Ext.	R. Int.	Wood.	S.	940x130	1000x130
Delahaye	5	165	66	4-100x160	Blk.	L.	Fix.	Pres.	P.	Opt.	Yes.	Con.	4	Chn.	.	Tr.	Ext.	R. Int.	Wood.	S.	950x140	1030x160
Delaunay-Belleville	3	142	67	4- 90x150	Prs.	L.	Fix.	Pres.	P.	None.	None.	Dsk.	4	D. R.	O.	Tr.	Ext.	R. Int.	Wood.	P.	930x120	930x120
Delaunay-Belleville	4	157	67	4-100x140	Prs.	L.	Fix.	Pres.	P.	None.	Yes.	Dsk.	4	Chn.	.	Tr.	Ext.	R. Int.	Wood.	S.	930x120	1000x140
Delaunay-Belleville	5	157	67	4-100x140	Prs.	L.	Fix.	Pres.	P.	None.	Yes.	Dsk.	4	Chn.	.	Tr.	Ext.	R. Int.	Wood.	S.	930x120	1030x160
Dewald	7½	169	67	4-110x150	Prs.	L.	Fix.	Pres.	P.	Yes.	Yes.	Con.	4	Chn.	.	Tr.	Ext.	R. Int.	Wood.	S.	1030x180	1030x200
Exshaw (Steam)	7	137	86	2-155x140	Sep.	.	.	Pres.	.	.	.	.	.	Chn.	.	.	.	.	Stl.	S.	900x160	970x180
Latil	10[1]	137	71	4-105x140	Blk.	L.	Fix.	Circ.	T.	None.	Yes.	Con.	5	I. G.	.	R.	Int.	R. Int.	Stl.	S.	1000x140	1000x130
Latil	3[2]	137	66	4-105x140	Blk.	L.	Fix.	Circ.	T.	None.	Yes.	Con.	4	I. G.	.	R.	Int.	R. Int.	Disk.	P.	955x155	955x155
Latil	20[2]	118	71	4-120x160	Blk.	L.	Fix.	Circ.	T.	None.	Yes.	Con.	5	I. G.	.	R.	Int.	R. Int.	Stl.	S.	1160x120	1160x120
Panhard-Levassor	1½	122	60	4- 72x140	Blk.	L.	Fix.	Circ.	P.	Yes.	None.	Pla.	4	Bev.	E.	R.	Int.	R. Int.	Disk.	P.	880x120	880x120
Panhard-Levassor	3	146	67	4- 85x140	Blk.	S.	Det.	Circ.	P.	Yes.	Yes.	Pla.	4	Bev.	E.	R.	Int.	R. Int.	Disk.	P.	955x155	955x155
Peugeot	4	154	63	4-100x150	Blk.	L.	Fix.	Pres.	P.	No.	Yes.	Con.	4	Wrm.	E.	Tr.	Ext.	R. Int.	Stl.	S.	940x130	1000x130
Peugeot	4	154	63	4-100x150	Blk.	L.	Fix.	Pres.	P.	Opt.	Yes.	Con.	4	Wrm.	E.	Tr.	Ext.	R. Int.	Disk.	P.	955x155	955x155
Renault	1½	146	60	4- 80x140	Blk.	L.	Fix.	Circ.	T.	Yes.	No.	Con.	4	D. R.	E.	Tr.	Ext.	R. Int.	Disk.	P.	835x135	835x135
Renault	3	150	67	4- 95x160	Blk.	L.	Fix.	Circ.	T.	Yes.	Yes.	Con.	4	Bev.	E.	Tr.	Ext.	R. Int.	Disk.	P.	955x155	955x155
Renault	5	165	67	4- 95x160	Blk.	L.	Fix.	Circ.	T.	No.	Yes.	Con.	4	Pln.	O.	Tr.	Ext.	R. Int.	Stl.	S.	950x130	1030x130
Renault	7	188	67	4-125x160	Prs.	L.	Fix.	Circ.	T.	Yes.	Yes.	Con.	4	Pln.	O.	Tr.	Ext.	R. Int.	Stl.	S.	970x180	1000x130
Rochet-Schneider	1½	130	56	4- 80x130	Blk.	L.	Fix.	Pres.	T.	None.	No.	Con.	4	Bev.	E.	Tr.	Ext.	R. Int.	Disk.	P.	880x120	880x120
Saurer	3	162	63	4-100x170	Blk.	L.	Fix.	Circ.	P.	Yes.	Yes.	Con.	4	D. R.	O.	R.	Int.	R. Int.	Wood.	S.	1010x120	1050x160
Saurer	5	177	64	4-110x180	Blk.	L.	Fix.	Circ.	P.	Yes.	Yes.	Con.	4	D. R.	O.	R.	Int.	R. Int.	Wood.	S.	955x155	955x155
S. O. M. U. A.	5	152	69	4-105x150	Sep.	I.	Fix.	Pres.	P.	None.	Yes.	Dsk.	3	I. G.	O.	Tr.	Ext.	R. Bnd.	Stl.	S.	900x140	950x150
S. O. M. U. A.	7	152	69	4-110x150	Sep.	I.	Fix.	Pres.	P.	None.	Yes.	Dsk.	3	I. G.	O.	Tr.	.	R. Bnd.	Stl.	S.	900x140	950x150
Unic	1½	123	52	4- 80x130	Blk.	L.	.	Pres.	P.	Opt.	Yes.	Con.	4	D. R.	O.	Tr.	Ext.	R. Ext.	Disk.	P.	820x120	820x120
Unic	2¼	139	60	4- 80x130	Blk.	L.	.	Pres.	P.	Opt.	Yes.	Con.	4	D. R.	O.	Tr.	Ext.	R. Ext.	Disk.	P.	895x135	895x135
ITALIAN																						
Fiat	1	110	55	4- 80x140	Blk.	L.	Fix.	Pres.	P.	None.	No.	Dsk.	4	Bev.	E.	Tr.	Ext.	R. Int.	Disk.	P.	820x120	820x120
Fiat	1½	120	55	4-100x140	Blk.	L.	Fix.	Pres.	P.	None.	No.	Dsk.	4	Bev.	E.	Tr.	Ext.	R. Int.	Disk.	P.	880x120	880x120
Fiat	4	142	65	4-100x180	Blk.	L.	Fix.	Pres.	P.	None.	Yes.	Dsk.	4	Chn.	.	Tr.	Ext.	R. Int.	Stl.	S.	900x110	1060x120
Fiat	7	137	70	4-130x200	Blk.	L.	Fix.	Pres.	P.	None.	Yes.	Dsk.	4	Chn.	.	Tr.	Ext.	R. Int.	Stl.	S.	900x160	1200x180
Spa	3	145	66	4- 95x200	Blk.	L.	Fix.	Pres.	P.	None.	None.	Dsk.	4	Chn.	O.	Tr.	Ext.	R. Int.	Stl.	S.	820x100	950x100
SWISS																						
Berna	3	161	62	4-100x170	Blk.	L.	Fix.	Pres.	P.	None.	Yes.	Dsk.	4	Bev.	E.	Tr.	Ext.	R. Int.	Wood.	S.	900x120	930x120
Berna	5	173	63	4-115x160	Blk.	L.	Fix.	Pres.	P.	None.	Yes.	Con.	4	I. G.	O.	Tr.	Ext.	R. Int.	Stl.	S.	900x160	1030x160

ABBREVIATIONS:—

Capacity:
P—Passengers

Cylinder Head:
Fix—Integral
Det—Detachable

Camshaft Drive:
Ch—Chain

He—Helical Gears
Sp—Spur Gears

Valve Location:
F—1 valve in head and 1 at side
I—Both valves in head
L—Both valves at side
S—Sleeve valve
T—Valves on opposite sides

Type of Lubricating System:
Pres—Pressure
Circ. or **Spl**—Splash (including systems which have pressure feed to main bearings only.)

Water Circulation:
P—Pump
T—Thermo-Syphon

Electric System:
Eisem—Eisemann
Opt—Optional

Governor:
Cent—Centrifugal

Clutch Type:
Con—Cone
D-C—Double Cone
Dsk—Disk
Pla—Plate

Percentages of Design Features in British Trucks, 1922

(*Continued from page* 365)

Ignition; Type

Magneto	98 per cent
Battery	2 per cent

Ignition Timing Control

Variable	87 per cent
Fixed	13 per cent

Impulse Starter

No	73 per cent
Extra	21 per cent
Yes	6 per cent

Electric Lighting

Extra	90 per cent
No	6 per cent
Yes	4 per cent

Electric Starter

No provision	65 per cent
Supplied at an extra cost	35 per cent

Fuel Feed

Gravity	89 per cent
Vacuum	6 per cent
Pressure	3 per cent
Optional	2 per cent

Tank Location

Underseat	67.0 per cent
On dashboard	28.0 per cent
Optional	2.0 per cent
At rear of frame	1.5 per cent
At side of frame	1.5 per cent

Engine Bearings—Crankshaft, Number

3	88 per cent
5	10 per cent
2	2 per cent

Crankshaft, Type

Plain	88 per cent
Ball	10 per cent
Roller	2 per cent

Camshaft, Number

3	84 per cent
4	13 per cent
5	3 per cent

Camshaft, Type

Plain	76 per cent
Ball and plain	15 per cent
One ball, 2 plain	6 per cent
Roller and plain	3 per cent

Gearset Bearings—Mainshaft; Front

Ball	81 per cent
Roller	11 per cent
Plain	8 per cent

Mainshaft, Rear

Ball	74.5 per cent
Roller	11 per cent
Plain	8 per cent
Ball and roller	6.5 per cent

Chassis Specifications—1922

NATIONALITY MAKE AND MODEL	Tons or Passenger Capacity	Wheelbase (Ins.)	No. Cyls. Bore and Stroke (Mm.)	Normal R.P.M.	Brake Horse Power	Valve Location	Camshaft Drive	Type of Lubricating System	Water Circulation	Electric System	Governor Type	Clutch Type	Forward Speeds	Final Drive	Torque Taken by	Type of Steering Gear	BRAKES Type & Location: Hand	BRAKES Type & Location: Foot	Chassis Weight (Lbs.)	Type of Wheels	TIRES: Kind	TIRES: Size in Millimetres: Front	TIRES: Size in Millimetres: Rear
GERMAN																							
Adler L	2	142	4- 86x135	1600	34	L...	Sp..	Spl...	P...	Bosch.	None..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	3200	C. St..	P...	975x175	1075x225
Adler L3D	3	169	4-101x156	1000	40	L...	Sp..	Spl...	P...	Eisem.	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	7060	C. St..	S...	930x140	1010x120
Adler L5A	5	178	4-110x156	1000	40	L...	Sp..	Spl...	P...	Fenag.	Cent..	Con..	4	Chn..	....	Scr...	Int. R..	Ext. Tr..	7500	C. St..	S...	930x140	1030x140d
Benz 1½	1½	142	4-100x150	1200	30	L...	He..	Spl...	P...	Bosch.	Cent..	Dsk..	4	S. B..	T.T.	Scr...	Int. R..	Ext. Tr..	3860	Wood	P...	925x150	1025x200
Benz Bus	22P	165	4-110x165	1000	40	L...	He..	Spl...	P...	Bosch.	Cent..	Dsk..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	5960	S. dsk.	S...	930x120	930x120d
Benz 5	5	167	4-120x180	1000	50	L...	He..	Spl...	P...	.....	Cent..	Dsk..	4	Chn..	.....	Scr...	Int. R..	Ext. Tr..	7060	C. St..	S...	930x120	1050x160d
Bergmann 3½	3½	162	4-110x150	1150	38	L...	Sp..	Spl...	P...	.....	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	7720	C. St..	S...	.....	.....
Bergmann 2½	2½	152	4-110x150	1050	35	L...	Sp..	Spl...	P...	Bosch.	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	5070	C. St..	S...	.....	.....
Buessing II Bus	22P	173	4-110x150	1000	45	I...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	5300	A. dsk.	P...	975x175	1150x250
Buessing III Bus	26P	173	4-110x150	360	40	I...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	7060	C. St..	S...	930x120	1030x140d
Buessing V	4-5	181	4-130x130	860	40	I...	He..	Pres..	P...	Bosch.	Cent..	Con..	4	Chn..	....	Wrm..	Int. R..	Ext. Tr..	8050	C. St..	S...	930x140	1050x160d
Daag E.C.	3-4	163	4-110x160	1000	45	L...	Sp..	Pres..	P...	.....	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	6830	C. St..	S...	930x120	1030x150d
Daag E.K.	4-5	179	4-125x160	1000	50	L...	Sp..	Pres..	P...	.....	Cent..	Con..	4	Chn..	....	Wrm..	Int. R..	Ext. Tr..	7500	C. St..	S...	930x140	1050x160d
Daimler D.C.30	3½	157	4-108x150	1000	38	I...	Sp..	Pres..	P...	Opt...	Cent..	Con..	4	Bev..	T.A.	Scr...	Int. R..	Ext. Tr..	6520	C. St..	S...	770x120	770x140
Daimler DR4-5	4½	164	4-120x160	880	45	I...	Sp..	Pres..	P...	Opt...	Cent..	D.C..	4	I.G..	.....	Scr...	Int. R..	Ext. Tr..	8600	C. St..	S...	770x140	850x160
Dixi 4	4-5	171	4-120x180	850	55	L...	Sp..	Spl...	P...	.....	Cent..	Con..	4	Chn..	....	Scr...	Int. R..	Ext. Tr..	6830	C. St..	S...	830x120	1030x140d
Dixi 3	3	157	4-110x165	1000	45	L...	Sp..	Spl...	P...	Bosch.	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	6280	C. St..	S...	930x120	1030x140d
Dixi 2	2	150	4- 95x165	1000	35	L...	Sp..	Spl...	P...	Bosch.	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	5070	C. St..	S...	930x120	930x120d
Duerkopp L¾	¾	129	4- 91x100	1500	24	L...	Sp..	Spl...	T...	.....	Cent..	Con..	4	S.B..	T.T.	Wrm..	Int. R..	Ext. Tr..	....	Wood.	P...	820x120	820x135
Duerkopp L1½	1½	141	4- 90x130	1500	28	L...	Sp..	Spl..	P...	.....	Cent..	Con..	4	S.B..	T.T.	Wrm..	Int. R..	Ext. Tr..	....	Wood.	....	.....	.....
Duerkopp L3	3	164	4-115x130	1200	30	L...	Sp..	Spl...	P...	.....	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	....	C. St..	S...	930x120	1030x140d
Duerkopp L4-5	4-5	173	4-130x160	1100	56	L...	Sp..	Spl...	P...	.....	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	....	C. St..	S...	930x140	1050x160d
Faun B	2	152	4-116x150	950	42	L...	Sp..	Spl...	P...	Bosch.	Cent..	Dsk..	4	Wrm..	T.T.	Scr...	Int. R..	Ext. Tr..	4780	S. dsk.	S...	920x110	920x110d
Faun SN	3½	161	4-116x150	950	42	L...	Sp..	Spl...	P...	Bosch.	Cent..	Dsk..	4	Wrm..	Spr..	Scr...	Int. R..	Ext. Tr..	5960	Wood.	S...	830x120	930x120d
Faun SA4	4-5	161	4-116x150	950	42	L...	Sp..	Spl...	P...	Bosch.	Cent..	Dsk..	4	Chn..	....	Scr...	Int. R..	Ext. Tr..	7950	C. St..	S...	930x120	1030x140d
Hansa-Lloyd L1½	1½	138	4- 90x140	1200	30	L...	Ch..	Pres..	T...	Bosch.	Cent..	Dsk..	4	Wrm..	T.T.	Scr...	Int. R..	Ext. Tr..	4080	C. St..	S...	860x 90	860x 90d
Hercules B1½	1½	147	4- 82x120	1100	20	L...	He..	Pres..	P...	.....	Cent..	Con..	3	Bev..	T.A.	Scr...	Int. R..	Ext. Tr..	....	Wood.	S...	860x 90	870x100
Hercules G2	2	152	4-110x150	1000	35	L...	He..	Pres..	P...	.....	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	5840	C. St..	S...	920x110	920x110d
Hille K3	3½	159	4-110x155	1100	40	I...	He..	Spl...	P...	.....	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	7720	C. St..	S...	930x120	1030x140d
Horch 1	1	136	4- 80x130	1800	30	L...	Ch..	Pres..	P...	Bosch.	Cent..	Con..	4	S.B..	T.T.	Scr...	Int. R..	Int. Tr..	2430	C. St..	P...	935x135	935x135
Horch 3	3	163	4-115x155	1000	42	L...	Ch..	Pres..	P...	Bosch.	Cent..	Con..	4	S.B..	T.T.	Scr...	Int. R..	Int. Tr..	6180	C. St..	S...	930x120	1010x120d
Magirus 1½	1½	129	4- 85x130	1400	25	L...	Sp..	Spl...	P...	Bosch.	Cent..	Dsk..	4	S.B..	Spr..	Scr...	Ext. R..	Ext. Tr..	3750	Wood.	P...	880x125	880x125d
Magirus 2	2½	135	4- 95x150	1200	34	L...	Sp..	Spl...	P...	Bosch.	Cent..	Dsk..	4	S.B..	T.A.	Scr...	Ext. R..	Ext. Tr..	4420	C. St..	S...	920x100	920x110
Magirus 2½	2½	140	4-110x160	1100	40	L...	Sp..	Spl...	P...	Bosch.	Cent..	Dsk..	4	S.B..	T.A.	Scr...	Ext. R..	Ext. Tr..	4850	C. St..	S...	920x110	930x120
Magirus 3½	3-3½	173	4-135x180	1100	70	L...	Sp..	Spl...	P...	Bosch.	Cent..	Dsk..	4	S.B..	T.T.	Scr...	Ext. R..	Ext. Tr..	6400	C. St..	S...	930x120	930x120
M.A.N. 2	2	152	4-112x160	1000	37	T...	Sp..	Pres..	P...	Opt...	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	4740	Wood.	S...	920x100	930x120d
M.A.N. 3	3-3½	165	4-112x160	1000	37	T...	Sp..	Pres..	P...	Opt...	Cent..	Con..	4	Bev..	T.T.	Wrm..	Int. R..	Ext. Tr..	5630	Wood.	S...	930x120	1030x140d
M.A.N. 4-5	4-5	160	4-120x180	1000	45	T...	Sp..	Pres..	P...	Opt...	Cent..	Con..	4	Chn..	....	Wrm..	Int. R..	Ext. Tr..	6420	Wood.	S...	830x120	1030x140d
Mannesmann-Mulag LC	3-3½	122	4-125x150	900	44	T...	Sp..	Pres..	P...	.....	Cent..	Con..	4	Bev..	T.A.	Wrm..	Int. R..	Ext. Tr..	6830	S. dsk.	S...	930x120	1030x140d
Mannesmann-Mulag 56C	4-5	165	4-130x150	900	52	T...	Sp..	Pres..	P...	.....	Cent..	Con..	4	Chn..	....	Wrm..	Int. R..	Int. Tr..	9260	S. dsk.	S...	930x140	1030x140d
Nacke III	3	157	4-108x160	950	38	F...	Sp..	Spl...	P...	.....	Cent..	Con..	4	Wrm..	Spr..	Scr...	Int. R..	Ext. Tr..	6620	C. St..	S...	930x120	1010x120d
N.A.G. L8	4-5	178	4-120x170	900	45	I...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	7	Bev..	T.A.	Scr...	Int. R..	Ext. Tr..	7280	S. dsk.	P...	1015x200	1015x200d
N.A.G. L8C	4-5	178	4-120x170	900	45	I...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Chn..	....	Scr...	Int. R..	Ext. Tr..	7620	C. St..	S...	930x140	1030x140d
N.A.G. KL	3	163	4-120x170	900	45	I...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.A.	Scr...	Int. R..	Ext. Tr..	6620	C. St..	S...	930x120	1030x140d
N.A.G. Bus	26P	166	4-120x170	900	45	L...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.A.	Scr...	Int. R..	Ext. Tr..	7180	C. St..	S...	930x120	1030x140d
Opel 4	4	168	4-115x150	1000	40	L...	He..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.A.	Wrm..	Int. R..	Ext. Tr..	....	C. St..	S...	930x120	1050x140d
Richard & Hering 2	2	169	4-100x140	1100	38	L...	Sp..	Pres..	P...	.....	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	3970	Wood.	S...	870x100	870x100d
Vomag 2	2	152	4-110x160	1000	35	L...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	5300	Wood.	S...	920x100	930x120d
Vomag 3	3	159	4-110x160	1000	35	L...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.T.	Scr...	Int. R..	Ext. Tr..	5960	Wood.	S...	930x120	1010x120d
Vomag 3C	3	165	4-110x160	1000	35	L...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Chn..	....	Scr...	Int. R..	Ext. Tr..	6400	Wood.	S...	930x120	930x120d
Vomag 4-5C	4-5	178	4-115x160	1000	42	L...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Chn..	....	Scr...	Int. R..	Ext. Tr..	6620	C. St..	S...	930x120	1030x140d
Vomag 4-5	4-5	178	4-115x160	1000	42	L...	Sp..	Pres..	P...	Bosch.	Cent..	Con..	4	Bev..	T.T..	Scr...	Int. R..	Ext. Tr..	6620	C. St..	S...	930x120	1030x140d

Propeller Shaft:
O—Open
E—Enclosed

Final Drive:
Bev—Bevel Gear
Chn—Chain
D-R—Double reduction
I-G—Internal Gear
S-B—Spiral Bevel

Pln—Planetary
Wrm—Worm

Torque Taken By:
Spr—Springs
T-T—Torque Tube
T-A—Torque Arm

Type of Steering Gear:
Scr—Screw
Wrm—Worm

Type of Wheels:
A-dsk—Aluminum Disk
C-St—Cast Steel
C-Sol—Cast Solid
S-dsk—Steel Disk
Stl—Steel

Brake Type and Location:
R—on Rear Wheels
Tr—On Gearset

Bnd—Band
Int—Internal
Ext—External

Tires, Kind:
P—Pneumatic
S—Solid
d—Dual

*—all rear tires on French, Italian and Swiss trucks listed are dual.

Layshaft, Front and Rear

Ball	81 per cent
Roller	11 per cent
Plain	8 per cent

Pilot

Ball	49 per cent
Plain	34 per cent
Floating bush	10 per cent
Roller	7 per cent

Wheel Bearings, Front

Floating bush	60 per cent
Roller	16.5 per cent
Plain	16.5 per cent
Ball	7 per cent

Rear

Floating	53 per cent
Plain	20 per cent
Roller	18 per cent
Ball	9 per cent

Differential Bearings

Ball	82 per cent
Roller	13 per cent
Plain	5 per cent

Clutch, Type

Cone	58 per cent
Dry single plate	22 per cent
Inverted cone	18 per cent
Dry multiplate	2 per cent

Clutch Shaft Universals, Type; Front

Fabric disk	41 per cent
Pot	15 per cent
Miscellaneous metallic	14 per cent
Toothed ring	10 per cent
Leather disk	8 per cent
Steel disk	7 per cent
Sliding	5 per cent

Rear

Fabric disk	40 per cent
Miscellaneous	22 per cent
Pot	16 per cent
Leather disk	9 per cent
Steel disk	9 per cent
Toothed ring	4 per cent

Gearset Location

Separate in main frame	58 per cent
Separate in sub frame	37 per cent
Unit with engine	5 per cent

No. of Speeds

4	76 per cent
3	22 per cent
3 or 4	2 per cent

Position of Lever

Right	89 per cent
Central	11 per cent

Propeller Shaft, Type

Open	77 per cent
Semi-enclosed	23 per cent

Propeller Shaft Joints, Front

Star	50 per cent
Pot	15 per cent
Cross pin	12 per cent
Leather disk	12 per cent
Fabric disk	9 per cent
Internal tooth	2 per cent

Tractor Design Trends Reflected in 1922 Specifications

More models in three-plow class than in other size groups. Tendency toward higher plowing speeds is noted. Proportion of valve-in-head engines shows marked increase but percentage of vertical cylinder types is decreased. Water injection with fuel in over 40 per cent of all models listed.

By P. M. Heldt

THE table of tractor specifications this year covers 123 tractor models. It includes only tractors adapted for field plowing, and no motor cultivators and garden tractors. These are listed in a separate table on pages 372 and 373. One reason for eliminating these two classes from the table is not that we consider them of lesser importance, but rather that, by confining the table to regular field tractors, we get a more precise picture of practice in tractor design when working out the percentages of various features. The table last year contained the specifications of 122 tractors, among which there were six motor cultivators and garden tractors. It would thus seem that the industry during the past year had grown, in spite of the unfavorable economic situation. The growth referred to, of course, is one measured by number of models in production and not by volume of business done.

Of the 123 tractors listed, four are 1-plow tractors; 13, 2-plow; 8, 2-3 plow; 34, 3-plow; 14, 3-4 plow; 20, 4-plow; 5, 4-5 plow, and 17, 5 or more plow, while 8 have no plow rating. For tractors to have no rating in terms of the number of plow bottoms they will pull is new.

Last year we included the 2-3-plow tractors in the 2-plow class and the 3-4 plow tractors in the 3-plow class. Following that method, the tractors listed this year divide as follows: Single-plow, 4; 2-plow, 21; 3-plow, 48; 4-plow, 25; more than 4-plow, 17; no rating, 8.

Plowing speeds of the 2-plow tractors vary all the way from 2 to 3½ m.p.h., the average being 2.62 m.p.h. In the 3-plow class the limits of speeds are exactly the same, but the average is a trifle lower—2.59 m.p.h. Speeds of 4-plow tractors vary from 2 to 3¼ m.p.h. and the average figures out to 2.57 m.p.h. The tractors of more than 4-plow capacity have plowing speeds of 1.9 to 3 m.p.h., the average being 2.31 m.p.h.

Some years ago the S.A.E. Tractor Division adopted a standard plowing speed of 2 1/3 m.p.h., which was based on the average practice at that time. It will be seen from the averages derived from our table that there is a tendency toward increased plowing speeds, and there are few new models brought out that are designed to operate at less than 3 m.p.h., but in view of the numerous old models which are continued from year to year the average naturally changes slowly.

There is a strong tendency toward the use of the valve-in-head engine, which is more pronounced in the tractor field than in any other branch of the automotive industry except possibly that of aircraft. Of this year's tractors 55.5 per cent have valve-in-head engines, 42.8 per cent L-head and 1.7 per cent (two models) T-head engines.

The vertical engine being very far in the lead in all other branches of the industry, one would naturally expect it to gain in the tractor industry, where the horizontal type is rather strongly intrenched with the old line manufacturers. It is therefore quite surprising to find that whereas last year the vertical engines constituted 76 per cent of the total, this year their proportion amounted to only 71.5 per cent, the remainder in each case being horizontal engines.

In making a comparison of the percentages of engines with different numbers of cylinders, it is seen that the four-cylinder had gained somewhat. This gain is very slight, however, and is accounted for by the fact that this year single and six-cylinder engines are each found on only a single tractor, as against two tractor models each last year. The comparative figures are as follows:

	1921	1922
Single cylinder engines	2 per cent	0.8 per cent
Two cylinder engines	15 per cent	14.7 per cent
Four cylinder engines	81 per cent	83.7 per cent
Six cylinder engines	2 per cent	0.8 per cent

Another unexpected discovery is that block casting has receded in popularity; considering only the four-cylinder engines, 54 per cent were block-cast last year, but only 42.9 per cent this year. The pair-cast engine is now found on 47.6 per cent of the four-cylinder tractors, as compared with 38 per cent last year, and the singly cast on 9.5 per cent, as compared with 8 per cent last year.

Governors are almost universally fitted to the engines, and with two exceptions these are of the centrifugal type. One of the exceptions is an hydraulic governor and the other an electric. Only the Oil-Pull tractor uses oil as the cooling medium, all others employing water.

While in respect to most features the changes one way or the other are insignificant, there has been a decided trend away from thermo-siphon toward pump circulation of the cooling medium. Last year 26 per cent of all tractors had thermo-siphon cooling, this year the proportion has shrunk to 16.3 per cent. It would almost seem that in tractor work where, on account of the heavy duty character of the service and the frequent use of kerosene as fuel, the transfer of heat to the jacket is intense, the thermo-siphon system of circulation had not proved entirely satisfactory.

In connection with the lubrication system we have this year introduced a somewhat different system of classification from that employed last year, which renders a comparison impossible. We distinguish between the hollow crankshaft system, the circulating splash system and the mechanical lubricator system, also sometimes referred to as the non-circulating system. Then there is a fourth system in which oil is fed under pressure to the main bearings but all other parts are lubricated by splash. This simple classification does not fully identify each system, but is sufficiently definite to serve our purpose. It is found

that 41.7 per cent of the engines have hollow crankshaft lubrication; 40 per cent circulating splash; 15.8 per cent mechanical lubricators, and 2.5 per cent pressure lubrication without a hollow crankshaft.

Of the pumps employed in the lubricating system 63.1 per cent are of the gear type this year, as compared with 60 per cent last year; 29.1 per cent of the piston type as compared with 34.6 per cent, and 7.8 per cent of the vane or eccentric type, as compared with 5.4 per cent.

Water is injected with the fuel in 41.5 per cent of all tractor models. In connection with 22.8 per cent of the tractors listed no pretense is made to using any heavier fuel than gasoline. Hence of the tractors in which heavier fuels may be used, 54 per cent use water injection as a means of controlling the fuel knock.

Gravity fuel feed, always the predominant method in tractor practice, has almost exactly maintained its last year's standing. Its representation is 85.4 per cent this year as compared with 86 per cent last year. Vacuum fuel feed has gained somewhat at the expense of pump or pressure feed. In 1921, 9 per cent had pump feed and 5 per cent vacuum feed, while this year each method of feed is represented on 7.3 per cent of the tractors.

Fuel Tank Capacities

A determination was made this year for the first time of the average total fuel capacity of each class of tractor according to plow capacity. It was found that the 2-plow tractors have an average capacity of 15.5 gal.; the 2-3 plow, 21 gal.; the 3-plow, 22 gal.; the 3-4 plow, 24.5 gal., and the 4-plow, 30 gal. This refers to the total fuel capacities. That is, where provision is made for carrying two fuels, the capacities for both are added together. If we take the fuel capacities of the 2, 3 and 4-plow tractors we see that they are closely proportional to the plow capacities. For each plow a fuel supply of about 7½ gal. can be carried. The endeavor usually is to make the fuel tank capacity ample for a day's operations. As the fuel consumption increases with the speed of plowing—all other things being equal—it is well to note that this general average of 7½ gal. per plow bottom also corresponds to the average speed of about 2.6 m.p.h. If the plowing speed is higher it would evidently be advisable to provide, for a somewhat greater fuel supply, while if the speed is lower a smaller supply will suffice.

Only three models of tractors are being equipped with battery ignition and the magneto remains the almost exclusive ignition source. It is noteworthy that there are many blank spaces in the ignition system column, indicating that many manufacturers have not yet concluded arrangements for their ignition equipment for the year, or at least had not when the questionnaire was filled out.

Practice as regards types of clutch remains about the same. Disk and plate are still the most used type, shoe clutches holding second place. The percentages are as follows: Dry disk and plate, 52.7 per cent; shoe, 26.4 per cent; contracting, 8.2 per cent.; cone, 7.3 per cent; disk in oil, 5.4 per cent. Last year the classification was somewhat different, the disk in oil and the contracting clutches not being separated out, and friction driven tractors, which have no clutch, being included in the percentages. The proportions then were: Friction driven, 7 per cent.; cone, 3 per cent; disk, 60 per cent; block, 30 per cent. It is quite likely that most of the contracting clutches in this year's tabulation would also come under the heading block clutches.

Not so many tractors have three forward speeds as formerly. The following table gives a comparison of last year's tractors with the present ones with respect to number of forward speeds provided.

	1921	1922
Single speed	15 per cent	18 per cent
Two speeds	58 per cent	59 per cent
Three speeds	24 per cent	18 per cent
Four or more speeds	3 per cent	5 per cent

Fifteen out of 123 tractors are provided with a differential lock. Of course, there are a few among these 123 tractors which have no differential and therefore could not have a lock for same. Live axles, which mean completely enclosed drives at the center of the tractor, are found on 30.9 per cent of the models.

Steering is in 70.7 per cent of the models by means of steering knuckles, or what is known as the Ackermann steering, while 20 per cent have swinging front axles and 9.3 per cent miscellaneous steering mechanisms. Some of these 9.3 per cent are two-wheel tractors which steer by the curved rack or gear sector method, and at least one steers by means of a fork like a bicycle.

Thirteen of the 123 tractors listed, or 10.5 per cent, are of the creeper type. This compares with 6 per cent creepers in 1921, but with 14.5 and 14 per cent in 1920 and 1919 respectively.

Frames of structural steel, chiefly channels, are used on 78.4 per cent of all the models; pressed steel frames on 2.4 per cent; cast frames on 9.2 per cent, while 10 per cent of the tractors have no frames.

The wheelbase of a tractor is not easily changed, and if the averages this year are somewhat different from last year it is partly due to the fact that then the 2-3 plow tractors were counted as 2-plow and the 3-4 plow as 3-plow. The following table gives the averages for both years:

	1921	1922
Two-plow tractors	79.5 (79.5)	76.2
Two-three plow tractors	..	84.6
Three-plow tractors	85 (85.5)	85.2
Three-four plow tractors	..	86.4
Four-plow tractors	100	92

The figures in parenthesis indicate the results for 1922 worked out on the same basis as for 1921, and show that there has been no material change.

Drive wheel diameters during the two years compare as follows:

	1921	1922
Two-plow tractors	46.3 in.	47 in.
Three-plow tractors	53.4 in.	51.2 in.
Four-plow tractors	57 in.	58.4 in.

In this comparison all 2-3 plow tractors are counted as 2-plow and all 3-4 plow as 3-plow. Keeping the hypenated ratings apart, the results for 1922 are as follows: Two-plow, 44.5 in.; 2-3 plow, 50.4 in.; 3-plow, 50.5 in.; 3-4 plow, 52,5 in.; 4-plow, 56.5 in.; 4-5 plow, 67 in.

There has been no appreciable change in the average weight. Weights of 1922 tractors of the different classes average as follows: Two-plow, 3450 lb.; 2-3 plow, 4300 lb.; 3-plow, 5085 lb.; 3-4 plow, 6180 lb.; 4-plow, 7150 lb.; 4-5 plow, 12,000 lb.

Garden Tractors

Garden tractor and garden tractor engine specifications are given this year in a separate table as separate units, although some garden tractors have appeared in previous tabulations. These specifications are of special interest at this time, as there is a belief in certain quarters that the small tractor has an excellent commercial future.

Three firms are shown as manufacturing stock engines for garden tractors. Two of these stock jobs are of the 4-cycle type, the Evinrude motor being of the 2-cycle type. A non-detachable cylinder head is used in every case, as is the four-point engine support. Gasoline is the fuel burned in each of the stock garden tractor engine models.

Specifications of American

Name and Model	Price	Plow Capacity	Plowing Speed M. P. H.	H. P. Rating	Make	No. Cyl., Bore and Stroke	Cylinder Type	R. P. M.	Engine Type	Cylinder Cast	GOVERNOR		Weight, Lbs.	COOLING SYSTEM				LUBRICATION		FUEL	
											Make of Governor	Type of Governor		Cooling Fluid	Cooling Capacity, Gals.	Radiator Make	Fluid Circulat'n	Lubrication System, Type	Oil Pump, Type	Carburetor Make and Size, Ins.	Water Injected with Fuel
All-in-One A	$1,975	2-3	2½	15-30	Weidely	4-4x5½	L	900	Vert.	Block.	Weidely	Cent		W.	12½	Own	Pump.	Hol-C.S.	Piston.	Kingston 1¼	
Allis-Chalmers		1	2½	6-12	LeRoy	4-3½x4½	L	1000	Vert.	Block.	LeRoy	Cent		W.	3½	Own	Ther.	Circ-Sp.	Piston.	Kingston ⅞	No
Allis-Chalmers		3	2½	14-27	Midwest	4-4½x5¼	L	1100	Vert.	Pairs.	Midwest	Cent	905	W.	6	Own	Pump.	Hol-C.S.	Gear	Kingston 1¼	No
Allis-Chalmers		3-4	2½	18-30	Own	4-4¾x6½	L	830	Vert.	Block.	Own	Cent	1580	W.	10	Own	Pump.	Hol-C.S.	Gear	Kingston 1½	Yes
Allis-Chalmers		4	2½	22-38	Own	4-4¾x6½	L	930	Vert.	Block.	Own	Cent	1580	W.	10	Own	Pump.	Hol-C.S.	Gear	Kingston 1¾	No
Allwork G		3	2½	14-28	Own	4-4¾x6	L	900	Vert.	Singly.	Own	Cent	1180	W.	10	Perfex	Pump.		Piston.	Kingston 1½	No
Allwork C		3	2¾	14-28	Own	4-5x6	L	900	Vert.	Singly.	Own	Cent	1200	W.	12	Perfex	Pump.	Hol-C.S.	Gear	Kingston 1½	No
Andrews-Kinkade D	2,400				Climax	4-5x6¼	L	800	Vert.	Pairs.	Climax	Cent	1175	W.	12	Spirex	Pump.	Hol-C.S.	Vane	Stromberg 1½	Yes-K
Appleton	1,500			12-20	Buda	4-4¼x5½	L	1000	Vert.	Block.	Pickering	Cent	800	W.	8	Modine	Pump.	Hol-C.S.	Gear	Schebler 1½	Yes
Are	495					1-4½x5		800	Vert.	Singly.				W.	2	S-J	Ther.	Circ-Sp.	Piston	Schebler 1¼	
Aultman-Taylor		4	2¼	15-30	Climax	4-5x6½	L	900	Vert.	Pairs.	Climax	Cent	1100	W.	8½	G & O	Pump.	Hol-C.S.	Vane	Kingston 1⅜	No
Aultman-Taylor		6	2¼	22-45	Own	4-5½x8	L	600	Hori.	Pairs.	Own	Cent	2875	W.	85	Own	Pump.	Mech		Kingston 2	Yes
Aultman-Taylor		8-10	2¼	30-60	Own	4-7x9	L	550	Hori.	Pairs.	Own	Cent	3790	W.	120	Own	Pump.	Mech		Kingston 2½	Yes
Automotive	1,785	3		12-24	Hercules	4-4x5½	L	1000		Block.	Pierce	Cent	850	W.	7½	McCord	Pump.	Pres	Gear	Kingston	No
Avery		2-3		8-16	Own	2-5½x6	L	750	Opp.	Singly.	Own	Cent	925	W.	12½	Own	Ther.	Cire-Sp.	Gear	Kingston 1¼	Yes
Avery		3-4		12-20	Own	4-4½x6	L	950	Opp.	Block.	Own	Cent	1250	W.	11	Own	Pump.	Mech		Kingston 1¼	Yes
Avery		3-4		12-25	Own	2-6½x7	L	700	Opp.	Singly.	Own	Cent	1350	W.	17½	Own	Ther.	Cire-Sp.	Gear	Kingston 1½	Yes
Avery		3-4		14-28	Own	4-4½x7	L	900	Opp.	Block.	Own	Cent	1620	W.	30	Own	Ther.	Cire-Sp.	Gear	Kingston 1¼	
Avery		4-5		18-36	Own	4-5½x6	L	750	Opp.	Pairs.	Own	Cent	2150	W.	33	Own	Ther.	Cire-Sp.	Gear	Kingston 1⅜	Yes
Avery		5-6		25-50	Own	4-6½x7	L	700	Opp.	Pairs.	Own	Cent	2700	W.	55	Own	Ther.	Cire-Sp.	Gear	Kingston 2	Yes
Avery		8-10		45-65	Own	4-7¼x8	L	600	Opp.	Pairs.	Own	Cent	3300	W.	90	Own	Ther.	Cire-Sp.	Gear	Kingston 2	Yes
Avery		2			Own	6-3x4	L	1250	Vert.	Block.	Own	Throt	470	W.	6¾	Own	Ther.	Cire-So.	Gear	Kingston ⅞	No
Avery Track Runner		3	2½		Own	4-4x5½	L	1000	Vert.	Block.	Own	Hydr		W.			Pump.	Hol-C.S.		Kingston	
Bates		3	2½	15-25	Own	4-4½x6	L	800	Hori.	Block.	Own	Cent	975	W.	8	Own	Pump.	Hol-C.S.	Gear	Own 1½	Yes
Bates (Steel Mule) F		3	3½	18-25	Midwest	4-4¼x5¼	L	1100	Vert.	Pairs.	Simplex	Cent	1000	W.	6	Perfex	Pump.	Hol-C.S.	Gear	Bennett 1¼	No
Best 30	3,100	4	3½	18-30	Own	4-4¾x6½	L	800	Vert.	Singly.	Own	Cent	1600	W.	9	Own	Pump.	Hol-C.S.	Gear	Ensign 1½	No
Burn-Oil	1,495	3	4	15-30	Own	2-6¾x7	L	700	Hori.	Pairs.	Own	Cent		W.	16	Eureka	Pump.	Mech		Schebler 1½	No
Case 10-18		2	3	10-18	Own	4-3¾x5	L	1050	Vert.	Block.	Own	Cent		W.	9	Own	Pump.	Hol-C.S.	Piston	Kingston 1⅛	No
Case 15-27		3-4	2½-3	15-27	Own	4-4½x6	L	900	Vert.	Block.	Own	Cent		W.	11	Own	Pump.	Hol-C.S.	Piston	Kingston 1⅜	No
Case 22-40		4-5	3¼	22-40	Own	4-5½x6¾	L	850	Vert.	Pairs.	Own	Cent		W.	15½	Own	Pump.	Mech		Kingston 2	Yes
Caterpillar T-11		4	3	25-	Own	4-4¾x6	L	900	Vert.	Pairs.	Own	Cent	1400	W.	7½	Modine	Pump.	Hol-C.S.	Gear	Schebler 1½	No
Caterpillar T-16		6	3	40-	Own	4-6½x7	L	700	Vert.	Singly.	Own	Cent	2300	W.	12	Own	Pump.	Hol-C.S.	Gear	Kingston 2	No
Chase 12-25	1,825	3	2¾	12-25	Buda	4-4½x5½	L	1050	Vert.	Block.	Pierce	Cent		W.	8½		Pump.	Hol-C.S.	Gear	Kingston 1½	
Cletrac F	795			9-16	Own	4-3¼x4½	L	1600	Vert.	Block.	Own	Cent		W.		McCord	Pump.	Circ-Sp.	Piston	Tillotson 1	
Cletrac W	1,345	2	3½	12-20	Own	4-4x5½	L	1265	Vert.	Block.	Own	Cent		W.		McCord	Pump.	Mech	Gear	Kingston 1¼	No
Dakota	1,750	3	2¾	15-27	Doman	4-4¾x6	T	800	Vert.	Pairs.	Doman	Cent	800	W.	16	S-J	Pump.	Hol-C.S.	Gear	Linga 1¼	No
Depue A	2,800	3		20-30	Buda	4-4½x6	L	1000	Vert.	Block.	Simplex	Cent	950	W.	8	Perfex	Pump.	Hol-C.S.	Gear	Stromberg 1½	No
Emerson-Brantingham 12-20		3	2.7	12-20	Own	4-4¾x5	L	900	Vert.	Pairs.	Own	Cent	997	W.	7½	Modine	Pump.	Circ-Sp.	Piston	Stromberg 1½	Yes
Emerson-Brantingham Q		3	2.26	12-20	Own	4-4¾x5	L	850	Vert.	Pairs.	Pickering	Cent	1100	W.	9	Perfex	Pump.	Circ-Sp.	Piston	Bennett 1½	Yes
Emerson-Brantingham 16-32		4	2.26	16-32	Own	4-5¼x7	L	750	Vert.	Pairs.	Pickering	Cent	2000	W.	10	Modine	Pump.	Circ-Sp.	Piston	Stromberg 1¾	Yes
Fageol D		2	2.0	9-18	Lycoming	4-3½x5	L	1200	Vert.	Block.	Red Devil	Cent		W.		Perfex	Pump.	Circ-Sp.	Piston	Tillotson	No
Farm Horse B	1,885	4	2.5	18-30	Climax	4-5x6½	L	850	Vert.	Pairs.	Climax	Cent	1400	W.	10	S-J	Pump.	Mech	Vane	Bennett 1½	Yes
Farquhar 15-25		3-4	2.0	15-25	Buda	4-4½x6	L	1000	Vert.	Block.	Pierce	Cent	1057	W.	12	Perfex	Pump.	Hol-C.S.	Gear	Kingston 1¼	No
Farquhar 4-30		4-5	2.3	18-35	Own	4-6x8	L	550	Vert.	Pairs.	Own	Cent		W.	94	Own	Pump.	Circ-Sp.	Gear	Kingston 2	No
Farquhar 4-40		6-7	2.3	25-50	Own	4-7x8	L	550	Vert.	Pairs.	Own	Cent		W.	94	Own	Pump.	Circ-Sp.	Gear	Kingston 2	No
Fordson	395	2	2.5	-18	Own	4-4x5	L	1000	Vert.	Block.			650	W.	12	Own	Ther.	Circ-Sp.		Holley 1¼	Yes
Fox E	3,100	4	2.6	20-40	Own	4-5½x7½	L	650	Hori.	Pairs.	Own	Cent	2017	W.	12	Perfex	Pump.	Hol-C.S.		Kingston 1½	Yes
Frick A		2-3	2½	12-20	Erd	4-4x6	L	900	Vert.	Block.	Erd	Cent	900	W.	7¾	Perfex	Pump.	Circ-Sp.	Piston	Kingston 1¼	No
Frick C		3-4	2.1	15-28	Beaver	4-4¾x6	L	900	Vert.	Block.	Taco	Cent	1000	W.	9¾	Perfex	Pump.	Hol-C.S.	Gear	Bennett 1½	No
Gray		4	3.0	18-36	Waukesha	4-4¾x6¾	L	950	Vert.	Pairs.	Waukesha	Cent	840	W.	8		Pump.	Circ-Sp.	Gear	Bennett 1½	No
Hart-Parr	945	2	3.0	-20	Own	2-5¼x6½	L	800	Hori.	Pairs.	Own	Cent	890	W.	7¾	Perfex	Pump.	Mech	Piston	Schebler 1¼	Yes
Hart-Parr	1,295	3	3.0	-30	Own	2-6½x7	L	750	Hori.	Pairs.	Own	Cent	1170	W.	10	Perfex	Pump.	Mech	Piston	Schebler 1½	Yes
Heider D	870	2	2.5	9-16	Waukesha	4-4¼x5¾	L	1000	Hori.	Pairs.	Waukesha	Cent	800	W.	9	Perfex	Pump.	Circ-Sp.	Gear	Kingston 1	Yes
Heider C	995	3	2.25	12-20	Waukesha	4-4½x6¾	L	900	Hori.	Pairs.	Waukesha	Cent	900	W.	10	Perfex	Pump.	Circ-Sp.	Gear	Kingston 1¼	Yes
Huber	1,185	3	2.5	12-25	Waukesha	4-4½x5¾	L	1000	Vert.	Pairs.	Waukesha	Cent	600	W.	8	Perfex	Pump.	Circ-Sp.	Gear	Kingston 1¼	Yes
Huber	1,885	3	3.0	15-30	Midwest	4-4½x6	L	1000	Vert.	Pairs.	Taco	Cent	1200	W.	11¼	Perfex	Pump.	Hol-C.S.	Gear	Kingston 1¼	No
Illinois C		4	2.5	15-30	Climax	4-5x6½	L	850	Vert.	Pairs.	Climax	Cent	1000	W.	7	Modine	Pump.	Hol-C.S.	Eccentric	Stromberg 1½	No
Imperial	5,000	12	2.25	40-70	Own	4-7½x9	L	400	Hori.	Singly.	Own	Cent	4500	W.	45	Own	Pump.	Mech	Piston	Kingston 2	Yes
Indiana F	895	1	2.5	5-10	LeRoi	4-3½x4½	L	1000	Vert.	Block.	LeRoi	Cent	335	W.	5	Candler	Ther.	Circ-Sp.	Piston	Kingston 1	
International 8-16	670	2	2.75	8-16	Own	4-4¼x5	L	1000	Vert.	Block.	Own	Cent		W.	11		Ther.	Circ-Sp.	Piston	Ensign	No
International 15-30		3	3.0	15 30	Own	1-4½x6	L	1000	Vert.	Block.	Own	Cent		W.			Ther.	Circ-Sp.	Gear	Ensign	Yes
International 15-30		4	2.4	15-30	Own	1-5¼x8	L	575	Hori.	Pairs.	Own						Pump.	Mech		Own	Yes
Klumb		4	2.5	18-32	Climax	4-5x6½	L	850		Pairs.	Own	Cent	1150	W.	10	S-J	Pump.	Pres	Vane	Stromberg	Yes
Knudsen	2,000	4	3.0	25-45	Own	4-5½x9	L	500	Vert.	Singly.	Own	Cent	1500	W-O	35	Own	Ther.	Circ-Sp.	Ec'entric	Own 1¾	Yes
Lauson S	1,495	3	3.25	12-25	Midwest	4-4½x5¼	L	1200	Vert.	Pairs.	Taco	Cent	950	W.	8	Perfex	Pump.	Hol-C.S.	Gear	Kingston 1¼	No
Lauson 15-30	1,985	3-4	2.5	15-30	Beaver	4-4¾x6	L	950	Vert.	Block.	Taco	Cent	1100	W.	12	Perfex	Pump.	Hol-C.S.	Gear	Kingston 1½	
Leader M		3-4	2.25	16-32	Climax	4-5x6½	L	800	Vert.	Pairs.	Climax	Cent	1200	W.	12		Pump.	Hol-C.S.	Gear	Stromberg 1½	No
Leader G-U		3-4	2.25	18-36	Climax	4-5x6½	L	900	Vert.	Pairs.	Climax	Cent	1200	W.	12		Pump.	Circ-Sp.	Gear	Stromberg 1½	No
Leonard	2,530	3	2.7	20-30	Buda	4-4½x6	L	1000	Vert.	Block.	Duplex	Cent					Pump.	Hol-C.S.	Gear	Zenith 1¼	No
Linn	5,100	6	2.0		Waukesha	4-5x6¼	L	1000	Vert.	Pairs.	Waukesha	Cent	1000	W.		McCord	Pump.	Circ-Sp.	Gear	Schebler 1½	No
Little Giant B	2,200	4	2.5	16-22	Own	4-4½x5	L	950	Vert.	Pairs.	Own	Cent	1250	W.	9	S-J	Pump.	Circ-Sp.	Gear	Kingston 1½	Yes
Little Giant A	3,300	6	2.5	26-55	Own	4-5½x6	L	750	Vert.	Pairs.	Pickering	Cent	1650	W.	10	S-J	Pump.	Circ-Sp.	Gear	Stromberg 1¾	Yes
Minneapolis	900	3	2.21	12-25	Own	4-4½x7		750		Block.	Own	Cent		W.	8¾	Cellulos	Pump.	Mech		Kingston 1½	Yes
Minneapolis		3-4	2.75	17-30	Own	4-4¾x7		775			Own	Cent		W.	8½	S-J	Pump.	Mech		Kingston 1¾	Yes
Minneapolis		4-5	2.7	22-44	Own	4-6x7		700		Pairs.	Own	Cent		W.	14	S-J	Pump.	Mech		Kingston 2	Yes
Minneapolis		8-10	2.1	35-70	Own	4-7¼x9		550		Pairs.	Own	Cent		W.	60		Pump.	Mech		Kingston 2½	Yes
Mohawk E	785		2.25	8-16	Light	4-3¼x4½	L	1000	Vert.	Block.	Pierce	Cent	365	W.	6	Bush	Ther.	Circ-Sp.	Piston	Kingston 1	No
Moline D	990	2-3	3.0	9-18	Own	4-3½x5	L	1400	Vert.	Block.	Remy	Elec	720	W.	6	Modine	Ther.	Hol-C.S.	Gear	Holley 1¼	No
Nilson	2,475	4	2.5	20-40	Waukesha	4-5x6¼	L	900	Vert.	Pairs.	Waukesha	Cent	1000	W.	14	S-J	Pump.	Hol-C.S.	Gear	Stromberg 1½	No
Oil Pull K	1,485	3	2.1	12-20	Own	2-6x8	L	560	Hori.	Pairs.	Own	Cent		O.	10½	Own	Pump.	Circ-Sp.		Own 2¼	Yes
Oil Pull H	2,285	4	2.1	16-30	Own	2-7x8½	L	530	Hori.	Pairs.	Own	Cent		O.	15	Own	Pump.	Circ-Sp.		Own 2½	Yes
Oil Pull G	3,175	6	2.0	20-40	Own	2-8x10	L	450	Hori.	Singly.	Own	Cent		O.	17	Own	Pump.	Circ-Sp.		Own 2¾	Yes
Oil Pull E	4,590	8-10	1.9	30-60	Own	2-10x12		375	Hori.	Singly.	Own	Cent		O.	70	Own	Pump.	Circ-Sp.		Own 3¼	Yes
Oshkosh M	650	1	2.5	6-12	Own	2-4x6	L	1000	Hori.	Pairs.	Own	Cent	600	W.	8	Modine	Pump.	Hol-C.S.	Piston	Kingston 1¼	No
Oshkosh H	985	3	3.0	12-24	Own	2-6x7	L	900	Hori.	Pairs.	Own	Cent	900	W.	10	Modine	Pump.	Hol-C.S.	Piston	Kingston 1¾	Yes
Peoria L	1,600	3	3.0	12-25	Climax	4-5x6½	L	800	Vert.	Pairs.	Climax	Cent	1000	W.	11	Eureka	Pump.	Hol-C.S.	Eccentric	Stromberg 1½	No
Pioneer		4	2.5	20-40	Own	4-5½x6	L	750	Opp.	Pairs.	Pierce	Cent		W.	20	S-J	Pump.	Hol-C.S.	Gear	Kingston 1½	Yes
Pioneer		10	2.5	40-75	Own	4-7x8	L	650	Opp.	Pairs.	Own	Cent		W.	35	S-J	Pump.	Hol-C.S.	Gear	Kingston 2	Yes
Port Huron A	1,500	3		12-25	Chief	4-4¼x6	L	900			Pickering	Cent	1000	W.	8¾	Bremer	Pump.	Pres	Gear	Kingston	No
Reliable		2	2.25	10-20	Own	2-6x7	L	600	Hori.	Pairs.	Own	Cent	1120	W.	40	Own	Ther.	Mech	Piston	Own 1¼	Yes
Rex	1,600	3	2.5	12-25	Waukesha	4-4¼x5¾	L	900	Vert.	Pairs.	Waukesha	Cent		W.			Pump.	Circ-Sp.	Gear	Kingston 1½	No
Samson M		2-3	2.5-3.25		Own	4-4x5½	L	1100	Vert.	Block.	Own	Cent	839	W.	10		Pump.	Hol-C S.	Gear	Kingston 1¼	No
Sandusky J	1,250	2	2.0	10-20	Own	4-4¼x5¼	L	1050	Vert.	Block.	Own	Cent	849	W.	8	Perfex	Pump.	Circ-Sp.	Piston	Kingston 1¼	Yes
Sandusky E	1,750	4	2.0	15-35	Own	4-5x6½	L	750	Vert.	Singly.	Own	Cent	2060	W.	30	Perfex	Pump.	Circ-Sp.	Piston	Kingston 2	Yes
Shelby C		2	2.6	9-18	Waukesha	4-3¾x5¼	L	1000	Vert.	Block.	Waukesha	Cent	625	W.	8	Modine	Pump.	Circ-Sp.	Gear	Kingston 1¼	No
Shelby D		3	2.7	15-30	Beaver	4-4¾x6	L	900	Vert.	Block.	Taco	Cent	1000	W.	10	Modine	Pump.	Hol-C.S.	Gear	Kingston 1½	No
Steady Pull	1,485	3	2.5	12-24	Own	4-4x5	L	900	Vert.	Block.			800	W.	6	Perfex	Pump.	Circ-Sp.	Gear	Stromberg 1¼	No
Stinson	1,835	4	2.85	18-36	Beaver	4-4¾x6	L	1000	Vert.	Block.			1000	W.	10	Todd	Pump.	Hol-C.S.	Gear	Kingston 1⅜	Yes

Bring—Berling; **B.&B.**—Borg and Beck; **B-L**—Brown-Lipe; **Cent**—Centrifugal; **Circ-Sp**—Circulating Splash; **Cont**—Contracting Band; **D-D**—Dry Disk; **D-O**—Disk in Oil; **Dist**—Distillate; **Elec**—Electric; **Fric**—Friction; **G**—Gasoline; **Gr**—Gravity; **Hyd**—Hydraulic;

Farm Tractors for 1922

SYSTEM			Electrical	CLUTCH		TRANSMISSION						WHEELS				FRAME			
Fuel Feed	Fuel Tanks and Capacities, Gals	Air Cleaner, Make	Ignition System Make	Make	Type	Make of Transmission	Number Forw'd Speeds	Final Drive	Differential Lock	Drive Wheel Axle Type	Steering Type	No. Driving Wheels	Diameter and Face, Ins.	No. of Tracks	No. of Non-Drive Wheels	Material	Wheel-base, Ins.	Total Weight, Lbs.	Name and Model
Gr....	2-5G-22K...	Vortox...	Brlng.....	Detlaff..	D.D....	American..	2	Rim....	No..	Dead.....	Fork.....	2	52x8	....	1	Struct...	94	4800	All-in-One.....A
Gr....	1-8½G.....	Taco.....		B. & B..	D.D....	Own.....	1	Rim....	No..	Dead.....	Worm....	2	48x6	....	2	None...	80	2500	Allis-Chalmers.....
Gr....	1-20G.....	Taco.....		Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	46x12	....	2	None...	78	4400	Allis-Chalmers.....
Gr....	1-7⅜ G-25K.	Taco.....		Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	50x12	....	2	None...	94	6150	Allis-Chalmers.....
Gr....	1-35G.....	Taco.....		Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	50x12	....	2	None...	94	6150	Allis-Chalmers.....
Gr....	2-5G-23K...	Bennett..	Bosch.....	Own....	D.D....	Own.....	3	Spoke....	....	Rev.....	Knuckle..	2	38x12	....	2	Struct...	75	4800	Allwork.....G
Gr....	2-5G-24K...	Bennett..	Bosch & Kingston	Own....	D.D....	Own.....	3	Rim....	No..	Rev.....	Knuckle..	2	48x12	....	2	Struct...	80	5200	Allwork.....C
Gr....	2-25G-5K...	Bennett..	Dixie.....	Own....	D.D....	Own.....	2	Spoke...	No..	Dead.....	Knuckle..	2	54x14	....	2	Struct...	96	5000	Andrews-Kinkade.....D
Gr....	2-5G-20K...	Bennett..		B.&B..	D.D....	Nuttall...	2	Rim....	No..	Rev.....	Knuckle..	2	54x12	....	2	Struct...	96	4900	Appleton.....
Gr....	1-2G.....	Donaldson.	Brlng.....	Own....			1	Axle....	No..	Live.....		2	30x4	....	2	None...			Aro.....
Gr....	2-6G-16K...	Bennett..	Eisemann..	T.D....	D.D....	Own.....	1	Rim....	No..	Rev.....	Knuckle..	2	70x12	....	2	Struct...	98½	8100	Aultman-Taylor.....
Gr....	2-20G-35K...		Eisemann..	Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Swinging..	2	70x20	....	2	Struct...	102	12,800	Aultman-Taylor.....
Gr....	2-20G-60K...		Eisemann..	Own....	Shoe....	Own.....	1	Rim....	No..	Rev.....	Swinging..	2	90x24	....	2	Struct...	136	23,400	Aultman-Taylor.....
.....	1-18G.....	Bennett..	Eisemann..	B.&B..	Plate....	Own.....	2	Axle....	Yes.	Live.....	Power.....	2	40x10	....	2	Steel...	70	3,950	Automotive.....
Gr....	1-2¼G 13½K	Bennett..		Own....		Own.....	2	Spoke...	No..	Rev.....	Swinging..	2	50x12	....	2	Struct...	90	4,900	Avery.....
Gr....	1-6G-16K...			Own....	D.D....	Own.....	2	Hub.....	No..	Rev.....	Knuckle..	2	52x14	....	2	Struct...	80	6,000	Avery.....
Gr....	1-3¼G-20K..	Bennett..		Own....	Shoe....	Own.....	2	Spoke...	No..	Rev.....	Swinging..	2	56x20	....	2	Struct...	95	7,500	Avery.....
Gr....	1-3¼G-20K..	Bennett..		Own....	D.D....	Own.....	2	Spoke...	No..	Rev.....	Knuckle..	2	60x16	....	2	Struct...	96	7,540	Avery.....
Gr....	1-5½G-34K..	Bennett..		Own....	D.D....	Own.....	2	Spoke...	Yes.	Rev.....	Swinging..	2	65x20	....	2	Struct...	97	9,750	Avery.....
Gr....	1-5½G-34K..			Own....	D.D....	Own.....	2	Spoke...	No..	Rev.....	Swinging..	2	69x20	....	2	Struct...	114	12,500	Avery.....
Gr....	1-5½G-45K..			Own....	D.D....	Own.....	2	Spoke...	No..	Rev.....	Swinging..	2	87½x24	....	2	Struct...	138	22,000	Avery.....
Gr....	1-10K.....	Bennett..		Own....	D.D....	Own.....	3	Rim....	No..	Dead.....	Knuckle..	2	38x10	....	2	Struct...	90	3,164	Avery.....
Gr....	1-30G.....	Opt.....	Dixie.....	Own....	D.D....	Own.....	3	.....	.....	.....	Knuckle..	.....	.....	2	.....	.....	.....	5,000	Avery Track Runner.....
Gr....	2-2G-15K...	Own.....		Own....	Cont....	Own.....	3	Rim....	Yes.	Dead.....	Knuckle..	2	54x12	....	2	Struct...	80	4,000	Bates.....
Gr....	2-5-10G....	R.W.....	Bosch.....	B.&B..	D.D....	Own.....	2	Axle....	Yes.	Dead.....	Knuckle..	.....	.....	2	2	Struct...	80	4,850	Bates (Steel Mule).....F
Vac...	2-2¾G-30K..	Pomona..	Brlng.....	Own....	Plate....	Own.....	2	Rim....	....	Dead.....		.....	.....	2	.....	None...	.....	7,560	Best.....30
Gr....	1-30K.....	Bennett..		Own....	Cont....	Own.....	2	Rim....	No..	Live.....	Knuckle..	2	56x12	....	2	Cast....	.....	.....	Burn-Oil.....
Gr....	2-2G-10½K..	Own.....		Own....	Shoe....	Own.....	2	Spoke...	Yes.	Live.....	Knuckle..	2	42x9	....	2	Cast....	65	3,820	Case.....10-18
Gr....	2-2¾G-20K..	Own.....		Own & B.&B..	D.D....	Own.....	2	Spoke...	Yes.	Live.....	Knuckle..	2	52x14	....	2	Cast....	76½	6,460	Case.....15-27
Gr....	2-3¾G-26½K.	Own.....		Own....	Shoe....	Own.....	2	Spoke...	Yes.	Live.....	Knuckle..	2	56x16	....	2	Struct...	96	9,700	Case.....22-40
Vac...	1-45G.....	Own.....	Eisemann..	Own....	D.D....	Own.....	3	Axle....	....	.....	.....	.....	.....	2	....	Cast....	83	9,300	Caterpillar.....T-11
Vac...	1-45G.....	Own.....	K-W.....	Own....	D.D....	Own.....	3	Axle....	....	.....	.....	.....	.....	2	....	Cast....	98	19,500	Caterpillar.....T-16
Gr....	2-1G-9K....		Dixie.....	Bierman.	Shoe....	Own.....	2	Rim....	....	Dead.....	Knuckle..	2	48x12	....	1	Struct...	69	5500	Chase.....12-25
Gr....	2-1¼G-6K...	Own.....		B.&B..	Plate....	Own.....	1	Axle....	No..	.....	Swing ng..	.....	.....	.....	.....	None...	.....	.....	Cletrac.....F
Gr....	2-3¼G-13K..	Own.....		B.&B..	D.D....	Own.....	1	Axle....	No..	.....	.....	.....	.....	2	.....	Struct...	.....	.....	Cletrac.....W
Vac...	1-20G.....	Cyclone..		Bierman	Shoe....	Own.....	1	Axle....	.....	Live.....	Knuckle..	1	42x10	....	2	Struct...	108	5,300	Dakota.....
Gr....	1-16G.....	Cyclone..	Bosch.....	B.&B..	D.D....	Own.....	3	Axle....	No..	Live.....	Swinging..	4	40x12	....	....	Struct...	99	6,800	Dopue.....A
Gr....	2-4G-20K...	Bennett..	K.W.....	Own....	Cone....	Own.....	2	Spoke...	No..	Rev.....	Knuckle..	2	54x12	....	2	Struct...	87½	4,550	Emerson-Brantingham 12-20
Gr....	1-4G-16K...	Bennett..	K.W.....	Own....	Cone....	Own.....	3	Spoke...	No..	Dead.....	Knuckle..	2	60x12	....	2	Struct...	93	6,500	Emerson-Brantingham....Q
Gr....	1-5G-35K...	Bennett..	Simms.....	Own....	Cone....	Own.....	2	Spoke...	Yes.	Dead.....	Swinging..	2	72x16	....	2	Struct...	126	9,400	Emerson-Brantingham 16-32
Gr....	1-12G.....	Own.....	Dixie.....	Own....		Own.....	1	Axle....	....	.....	Knuckle..	2	.....	....	2	Struct...	77	3,500	Fageol.....D
Gr....	2-5G-18K...	Oren.....	Dixie.....	T.D....	D.D....	.....	2	Spoke...	No..	Dead.....	Knuckle..	2	52x26	....	2	Struct...	82	5,200	Farm Horse.....B
Gr....	2-5G-25K...	R.W.....	K.W.....	M.E....	D.D....	Own.....	2	Rim....	No..	Dead.....	Knuckle..	2	54x10	....	2	Struct...	83	5,700	Farquhar.....15-25
Gr....	2-30G-30K...		K.W.....	Own....	Fric....	Own.....	1	Rim....	No..	Dead.....	Swinging..	2	84x20	....	2	Struct...	132	16,000	Farquhar.....4-30
Gr....	2-30G-30K...		K.W.....	Own....	Fric....	Own.....	1	Rim....	No..	Dead.....	Swinging..	2	84x24	....	2	Struct...	132	19,000	Farquhar.....4-40
Gr....	2-1¼G-21K..	Own.....	Own.....	Own....	D.O....	Own.....	3	Axle....	No..	Live.....	Knuckle..	2	42x12	....	2	None...	63	2,425	Fordson.....
Vac...	2-2G-20K...		Dixie.....	Own....	Shoe....	Own.....	3	Spoke...	No..	Dead.....	Knuckle..	2	60x12	....	2	Struct...	90	6,700	Fox.....E
Gr....	2-3G-20K...	Bennett..		Own....	Shoe....	Nuttall...	2	Rim....	No..	Rev.....	Knuckle..	2	60x10	....	2	Struct...	92	5,700	Frick.....A
Gr....	1-3G-17K...	Bennett..		Own....	Shoe....	Nuttall...	2	Rim....	No..	Rev.....	Knuckle..	2	60x12	....	2	Struct...	92	6,450	Frick.....C
Gr....	1-34G.....	Bennett..	Bosch.....	Own....	Cone....	Own.....	2	.....	.....	Rev.....	Knuckle..	1	54x54	....	2	Struct...	.....	6,200	Gray.....
Gr....	2-1G-14K...	Own.....	K.W.....	Own....	Cont....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	46x10	....	2	Struct...	76	3,750	Hart-Parr.....
Gr....	2-1G-23K...	Own.....	K.W.....	Own....	Cont....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	52x18	....	2	Cast....	89	5,275	Hart-Parr.....
Gr....	2-7G-14K...	Bennett..				Own.....	7	Axle....	No..	Live.....	Knuckle..	2	54x8	....	2	Struct...	90	4,000	Heider.....D
Gr....	2-7G-14K...	Bennett..				Own.....	7	Axle....	No..	Live.....	Knuckle..	2	57x10	....	2	Struct...	96	6,000	Heider.....C
Gr....	1-1¼G-22K..	Bennett..	Kingston..	Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	60x10	....	2	Struct...	91	5,000	Huber.....
Gr....	1-23¼G.....	R. W.....	Eisemann..	Own....	D.D....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	60x10	....	2	Struct...	91	5,800	Huber.....
Gr....	1-3G-15K...	Bennett..		T.D....	D.D....	Foote....	4	Axle....	No..	Live.....	Knuckle..	2	54x12	....	2	Struct...	92	5,000	Illinois.....C
Gr....	1 or 2-70G.	Bennett..	K.W.....	Own....	Shoe....	Own.....	2	Rim....	Yes.	.....	Swinging..	2	96x30	....	2	Struct...	137	20,800	Imperial.....
Gr....	1-12G.....	Bennett..	Kent.....	Own....		Own.....	4	Spoke...	No..	Dead.....	Swinging..	2	50x12	....	2	Cast....	.....	2,200	Indiana.....F
Gr....	2-14G-11¼K.	Own.....	Dixie.....	Own....	D.D....	Own.....	3	Spoke...	.....	Dead.....	Knuckle..	2	40x12	....	2	Struct...	85	3,600	International.....8-16
Gr....	2-1G-16K...	Own.....		Own....	D.D....	Own.....	....	Axle....	.....	Live.....	Knuckle..	2	50x12	....	2	Cast....	85	5,400	International.....15-30
Pres..	2-24K.....	Own.....		Own....		Own.....	2	Spoke...	.....	Dead.....	Knuckle..	2	66x14	....	2	Pressed.	94	8,700	International.....15 30
Gr....	5G-20K.....	Bennett..	Splitdorf..	Own....	Shoe....	Own.....	2	Axle....	No..	Live.....	Knuckle..	2	48x12	....	2	Channel	84	6,000	Klumb.....
Gr....	2-2G-40K...	Own.....	Kingston..	Own....	Shoe....	Own.....	2	Axle....	Yes.	Rev.....	Swinging..	2	60x18	....	....	Struct...	42	6,000	Knudson.....
Gr....	1-19G.....	Taco.....	Splitdorf..	Own....	Shoe....	Own.....	2	Spoke...	No..	Rev.....	Knuckle..	2	48x12	....	2	Struct...	78	4,500	Lausen.....S
Gr....	1-2G-18K...	Taco.....	Splitdorf..	Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	54x12	....	2	Struct...	86	6,000	Lausen.....15-30
Gr....	1-3½G-30K..	United...	Dixie.....	B.&B..	D.D....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	54x12	....	2	Struct...	76	5,800	Leader.....M
Gr....	1-3½G-20K..	United...	Dixie.....	B.&B..	D.D....	Own.....	2	.....	No..	Dead.....	.....	.....	.....	....	2	Struct...	.....	6,800	Leader.....G-U
Vac...	1-28G.....	Own.....	Dixie.....	Hilliard	D.D....	Own.....	2	.....	Yes.	.....	.....	4	50x12	....	....	Struct...	98	5,500	Leonard.....
Vac...	1-30G.....		Westinghouse	B-L....	D.D....	B-L.....	4	.....	No..	Dead.....	Knuckle..	2	.....	2	....	Struct...	135	11,000	Linn.....
Gr....	1-5G-20K...	Donaldson.		Own....	Cone....	Own.....	3	Rim....	No..	Dead.....	Knuckle..	2	54x14	....	2	Struct...	87	5,000	Little Giant.....B
Gr....	1-5G-35K...	Donaldson.		Own....	Cone....	Own.....	3	Rim....	No..	Dead.....	Knuckle..	2	66x20	....	2	Struct...	102	8,500	Little Giant.....A
.....	2-3G-18.3K.		K.W.....			Own.....	2	Axle....	.....	Live.....	Knuckle..	.....	56x12	....	....	Struct...	100	6,600	Minneapolis.....
.....	2-6.3G-17.8K	Bennett..	Dixie.....	Own....	D.D....	Own.....	2	Axle....	.....	Live.....	Knuckle..	.....	54x12	....	....	Struct...	79⅞	6,400	Minneapolis.....
.....	2-9G-30K...		K.W.....			Own.....	2	Axle....	.....	Live.....	Swinging..	.....	62x10	....	....	Struct...	109½	12,410	Minneapolis.....
.....	2-20G-80K...		K.W.....			Own.....	2	Axle....	.....	Live.....	Swinging..	.....	85x30	....	....	Struct...	136	22,500	Minneapolis.....
Gr....	1-2G-10K...	Bennett..		B.&B..	D.D....	Own.....	1	Axle....	No..	Live.....	Swinging..	2	42x8	....	2	Cast....	67½	2,300	Mohawk.....E
Gr....	1-15G.....	Bennett..	Remy.....	B.&B..	D.D....	Own.....	1	Rim....	Yes.	Dead.....	.....	2	52x8	....	....	None...	.....	3,380	Moline.....D
Gr....	1-28G.....	Bennett..	Bosch.....	T.D....	D.D....	Own.....	2	Axle....	No..	Live.....	Knuckle..	3	52x10	....	2	Struct...	100	6,850	Nilson.....
Pres..	2-1G-23K...	Donaldson.		Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	51x12	....	2	Struct...	80	6,682	Oil Pull.....K
Pres..	2-1G-31K...	Donaldson.		Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	56x16	....	2	Struct...	92½	9,600	Oil Pull.....H
Pres..	2-1G-45K...	Donaldson.		Own....	Shoe....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	64x20	....	2	Struct...	103	12,820	Oil Pull.....G
Pres..	2-3G-70K...			Own....	Shoe....	Own.....	1	Rim....	No..	Rev.....	Swinging..	2	80x30	....	2	Struct...	141	26,700	Oil Pull.....E
Gr....				Own....		Own.....	1	Rim....	Yes.	Dead.....	Knuckle..	2	48x7	....	2	Struct...	72	3,000	Oshkosh.....M
Gr....	2-1G-13K...	Bennett..	Kent.....	Own....	Cont....	Own.....	1	Rim....	Yes.	Rev.....	Knuckle..	2	56x10	....	2	Cast....	90	3,800	Oshkosh.....H
Gr....	1-5G-25K...	Taco.....	Eisemann..	Own....	Cone....	Own.....	3	Axle....	No..	Live.....	Knuckle..	2	50x12	....	2	None...	84	4,700	Peoria.....L
Gr....	1-30G.....	Bennett..		Own....	D.O....	Own.....	3	Hub.....	No..	Live.....	Knuckle..	2	60x18	....	2	Struct...	89	6,500	Pioneer.....
Gr....	2-75G-30K..	Bennett..	K.W.....	Own....	D.D....	Own.....	3	Hub.....	No..	Live.....	Knuckle..	2	96x24	....	2	Struct...	156	24,000	Pioneer.....
Gr....	5G-25K.....	Own.....	Eisemann..	Rock....	Fric....	Own.....	2	Rim....	No..	Rev.....	Knuckle..	2	56x10	....	2	Channel	93	5,960	Port Huron.....A
Pres..	1-15K.....		Dixie.....	Own....	Shoe....	Own.....	1	Axle....	No..	Live.....	Swinging..	2	48x10	....	2	Struct...	66	3,785	Reliable.....
Gr....	1-5G-20K...		K.W.....		D.D....	Own.....	2	Rim....	No..	Live.....	Knuckle..	2	60x10	....	2	Struct...	.....	5,600	Rex.....
Gr....	2-3G-20K...	Own.....	Simms.....	Own....	D.O....	Own.....	2	Axle....	No..	Live.....	Knuckle..	2	45x12	....	2	None...	64¼	3,034	Samson.....M
Gr....	1-5G-15K...	Bennett..		Own....	Cone....	Own.....	2	Rim....	No..	.....	Knuckle..	2	48x12	....	2	Struct...	96	4,724	Sandusky.....J
Gr....	1-5G-25K...	Bennett..		Own....	Shoe....	Own.....	3	Rim....	No..	.....	Swinging..	2	56x16	....	2	Struct...	100	8,228	Sandusky.....E
Gr....	1-17G.....	Bennett..	Dixie.....	Fuller..	D.O....	Fuller...	3	Axle....	No..	Dead.....	Knuckle..	2	42x12	....	2	Struct...	72	3,300	Shelby.....C
Gr....	2-4G-14K...	Bennett..	Dixie.....	T.D....	D.D....	Foote....	2	Rim....	No..	Live.....	Knuckle..	2	48x12	....	2	Struct...	80	4,500	Shelby.....D
Gr....	1-15G.....	Oren.....	Bosch.....	T.D....	D.D....	Foote....	2	Spoke...	No..	Dead.....	Knuckle..	2	42x12	....	2	Struct...	87	3,450	Steady Pull.....
Gr....	1-32¼K.....	Own.....	Dixie.....	Own....	Cont....	Own.....	1	Axle....	No..	Live.....	Knuckle..	2	60x12	....	2	Cast....	114	7,200	Stinson.....

Hori—Horizontal; **H-B**—Horizontal Bars; **Hol-C.S.**—Hollow Crankshaft; **K**—Kerosene; **Mech**—Mechanical Lubricator; **O**—Oil; **Pres**—Pressure; **Rev**—Revolving; **S-J**—Shotwell-Johnson; **Struct**—Structural Steel; **T-D**—Twin Disk; **Throt**—Throttle; **Vac**—Vacuum; **W**—Water.

Specifications of American

Name and Model	Price	Plow Capacity	Plowing Speed M. P. H.	H. P. Rating	Make	No. Cyl., Bore, and Stroke	Cylinder Type	R. P. M.	Engine Type	Cylinder Cast	GOVERNOR: Make of Governor	GOVERNOR: Type of Governor	Weight, Lbs.	COOLING SYSTEM: Cooling Fluid	COOLING SYSTEM: Cooling Capacity, Gals.	COOLING SYSTEM: Radiator Make	COOLING SYSTEM: Fluid Circulation	LUBRICATION: Lubrication System, Type	LUBRICATION: Oil Pump, Type	FUEL: Carburetor Make and Size, Ins.	FUEL: Water Injected with Fuel
Tioga	$2,625	3-4	2.7	15-27	Wis. MW.	4-4¼x6	I...	1000	Vert..	Pairs..	Pharo.....	Cent....	1200	W..	7¾	G. & O....	Pump.	Hol-C.S...	Gear....	Stromberg..1¼	No...
Titan (I. H. C.)	700	3	2.75	10-20	Own.....	2-6½x8	I...	575	Hori..	Pairs..	Own.....	Cent....	....	W..	40	Own.....	Ther..	Mech.....	.....	Ensign.....	No...
Topp-Stewart B	3,500	4	2.5	30-45	Waukesha.	4-4⅜x6¾	L...	950	Vert..	Pairs..	Waukesha.	Cent....	....	W..	12	Bremer....	Pump.	Circ-Sp....	Gear....	Stromberg..1½	No...
Toro	....	2	2.0	6-10	LeRoi.....	4-3½x4½	L...	1200	Vert..	Block.	LeRoi.....	Cent....	325	W..	4	S.-J.....	Ther..	Circ-Sp....	Piston...	Kingston... ⅞	No...
Townsend	895	2-3	2.5	10-20	Own.....	2-6½x7	I...	550	Hori..	Pairs..	Own.....	Cent....	1100	W..	50	Own.....	Pump.	.....	Piston...	Own..... 1½	Yes...
Townsend	1,485	3-4	2.5	15-30	Own.....	2-7x8	I...	500	Hori..	Pairs..	Own.....	Cent....	1600	W..	70	Own.....	Pump.	Hol-C.S...	Piston...	Own..... 1¾	Yes...
Townsend	2,750	6-8	2.5	35-50	Own.....	2-8½x10	I...	475	Hori..	Pairs..	Own.....	Cent....	2200	W..	100	Own.....	Pump.	Hol-C.S...	Piston...	Own..... 2¼	Yes...
Tracklayer 60	5,450	8	2.62	35-50	Own.....	4-6½x8½	I...	650	Vert..	Singly.	Own.....	Cent....	2600	W..	18	Own.....	Pump.	Circ-Sp....	Gear....	Ensign..... 2	No...
Traylor	715	1	2.75	6-12	LeRoi.....	4-3½x4½	L...	1200	Vert..	Block.	LeRoi.....	Cent....	330	W..	4	G. & O....	Ther..	Hol-C.S...	Gear....	Kingston... ⅞	No...
Trundaar	3,750	4	2.5	25-40	Waukesha.	4-5x6¼	L...	850	Vert..	Pairs..	Waukesha.	Cent....	....	W..	11	Modine...	Pump.	Hol-C.S...	Gear....	Stromberg..1½	.....
Twin City	1,580	3	2.9	12-20	Own.....	4-4¼x6	I...	1000	Vert..	Block.	Pierce.....	Cent....	1040	W..	10½	Modine...	Pump.	Hol-C.S...	Gear....	Holley..... 1¼	No...
Twin City	3,175	5	2.9	20-35	Own.....	4-5½x6¾	I...	900	Vert..	Block.	Own.....	Cent....	1800	W..	18	Modine...	Pump.	Hol-C.S...	Gear....	Holley..... 2	No...
Twin City	5,250	5-6	2.0	40-65	Own.....	4-7¾x9	I...	535	Vert..	Singly.	Own.....	Cent....	4125	W..	130	Own.....	Pump.	Mech.....	.....	Holley..... 2½	No...
Wallis K	.....	2-3	3.5	15-25	Own.....	4-4¼x5¾	I...	900	Vert..	Singly.	Own.....	Hyd....	750	W..	6	Modine...	Pump.	Circ-Sp....	Piston...	Bennett.... 1¼	No...
Waterloo Boy N	1,450	3	3.0	12-25	Own.....	2-6½x7	I...	750	Hori..	Pairs..	Own.....	Cent....	1200	W..	13	Modine...	Pump.	Circ-Sp....	Piston...	Schebler.... 1½	Yes...
Wellington B	.....	2-3	2.25	12-22	Erd.....	4-4x6	I...	900	Vert..	Block.	Erd.....	Cent....	860	W..	7	Modine...	Pump.	Circ-Sp....	Piston...	Stromberg..1⅜	No...
Wellington F	.....	3	3.0	16-30	Chief.....	4-4¾x6	I...	1000	Vert..	Block.	Chief.....	Cent....	1020	W..	9	Modine...	Pump.	Hol-C.S...	Gear....	Stromberg..1½	No...
Wetmore	1,585	3	3.37	12-25	Waukesha	4-4x5¾	L...	1000	Vert..	Pairs..	Waukesha.	Cent....	900	W..	....	Ideal.....	Pump.	Hol-C.S...	Gear....	Schebler.... 1¼	No...
Whitney B	595	2	2.5	9-18	Own.....	2-5½x6½	L...	750	Opp...	Singly.	Own.....	Cent....	650	W..	....	.....	Pump.	Mech.....	.....	..... 1½	No...
Wichita T	2,000	3-4	2.5	15-30	Beaver....	4-4½x6	I...	950	Vert..	Block.	Duplex....	Cent....	1080	W..	9	Perfex....	Pump.	Hol-C.S...	Gear....	Ensign..... 1¼	No...
Wisconsin	2,450	4	2.5	20-40	Waukesha	4-5x6½	L...	950	Vert..	Pairs..	Waukesha.	Cent....	1000	W..	12	Perfex	Pump.	Hol-C.S...	Gear....	Stromberg. 1½	No...
Wisconsin	3,200	5	2.5	.....	Climax....	4-5½x7	L...	800	Vert..	Pairs..	Climax....	Cent....	1500	W..	18	Perfex....	Pump.	Hol-C.S...	Eccentric	Stromberg..1½	No...
Yuba	3,100	....	.....	15-25	Wisconsin.	4-4¼x6	L...	800	Vert..	Block.	.....	.....	920	W..	5½	Modine...	Pump.	Circ-Sp....	Gear....	Stromberg..1¼	No...
Yuba	5,000	....	.....	25-40	Own.....	4-5½x7	I...	700	Vert..	Pairs..	Own.....	Cent....	....	W..	9	Modine...	Pump.	.....	.....	Stromberg..1¼	No...
Yuba	4,650	....	.....	25-40	Wisconsin.	4-5¾x7	T...	700	Vert..	Pairs..	Own.....	Cent....	1543	W..	9	Modine...	Pump.	Circ-Sp....	Gear....	Stromberg..1½	No...
Zelle	.....	3	2.5	12-25	Buda.....	4-4¼x5½	L...	1000	Vert..	Block.	Pierce.....	Cent....	....	W..	....	.....	Pump.	Hol-C.S...	Gear....	Carter.....	Yes...

Brlng—Berling; **B.&B.**—Borg and Beck; **B-L**—Brown-Lipe; **Cent**—Centrifugal; **Cir Sp**—Circulating Splash; **Cont**—Contracting Band; **D-D**—Dry Disk; **D-O**—Disk in Oil; **Dist**—Distillate; **Elec**—Electric; **Fric**—Friction; **G**—Gasoline; **Gr**—Gravity; **Hydr**—Hydraulic;

American Garden Tractor

NAME	Model	Price—Dollars	Rating—Horsepower	Type—Walking, Riding	Length Overall (Inches)	Width (Inches)	Height (Inches)	Clearance (Inches)	Total Weight (Pounds)	Engine Make	Number of Cylinders	Bore and Stroke (Inches)	Stroke—Cycle. Two or Four	Valve Arrangement	Revolutions per Min. Normal or Range	Governor—Make, Type	Engine Weight (Pounds)	Lubrication System—Splash with Fuel	Oil Supplied by	Ignition System—Battery, Magneto	Ignition Make
Acme Cultivator Co. Salem, Ohio	Acme, Jr....	215	-1.9	W...	76	18½	29	9	235	B. & S..	1	2½x2½	4	L..	1500	None..	45	Cir. spl..	Plgr...	Mag.	Own flywh.
American Farm Mach. Co., Minneapolis, Minn.	Kinkade....	140	3- 1½	W...	78	8½	20	....	180	Own....	1	3 x3	4	I..	700-1400	None..	100	Spl.....	Grav..	Opt..	.....
Beeman Tractor Co., Minneapolis, Minn.	G.....	285	1½-4	W...	86	17 -25	40	11½	560	Own....	1	3½x4½	4	L..	800-1200	.....	....	Spl.....	Grav..	Mag.	Heinze....
Central Tractor Co., Greenwich, Ohio	Centaur....	385	-5	Both.	70	30½	38	13	700	NewWy.	1	4½x4½	4	L..	800	Cent..	275	Spl.....	Grav.	Mag.	Bosch.....
H. C. Dodge, Inc., Boston, Mass.	Sprywheel...	150	-1	W...	63	7½	37	....	135	Own....	1	2½x2½	2	...	600-1000	None..	28	Wth fuel	.....	Both.	Bosch.....
Gilson Mfg. Co, Port Washington, Wis.	Bolens.....	180	-1.4	W...	64	18½	38	14	190	B. & S..	1	2½x2½	4	L..	1200	None..	43	Cir. spl..	Plgr..	Mag.	Flywh....
Midwest Engine Co., Indianapolis, Ind.	Utilitor, 501..	345	2½-4	W...	84	17½-30½	36	8	750	Own....	1	3½x4½	4	L..	1200	Funk....	....	Spl.....	Ring..	Mag.	Eisemann..
	Utilitor 501A..	395	2½-4	R....	88	23 -42	36	8	925	Own....	1	3½x4½	4	L..	1200	Funk....	....	Spl.....	Ring..	Mag.	Eisemann..
New Britain Machine Co., New Britain, Conn.	NB-2.....	375	6	Both.	98	28 -33	39	10	750	Own....	2	2¾x4	4	L..	1500	None..	....	Cir. spl..	Flywh.	Mag.	Sims.....

Garden Tractor

NAME	Model	Engine Rating Horsepower at R.P.M.	Stroke—Cycle	Number of Cylinders	Bore and Stroke Inches	Revolutions Per Minute Normal or Range	Engine Mounting Vertical—Horizontal	Piston Displacement Cubic Inches	Cylinder Head Detachable	Valve Arrangement	Inlet Valve Port Diameter Inches	Inlet Valve Lift Inches	Exhaust Valve Port Diameter Inches	Exhaust Valve Lift—Inches	Cam Follower Type	Volume of Compression Space Cubic Inches	Piston Length—Inches	Number of Piston Rings	Width of Piston Rings—Inches	Is Scraper Ring Used	Weight Piston with Pin and Rings Pounds	Weight of Connecting Rod Pounds	Length of Connecting Rod Center to Center—Inches	Width of Piston Pin Bearing Inches	Diameter Piston Pin Bearing Inches	Width Connecting Rod Lower End Bearing Inches	Diameter Connecting Rod Lower End Bearing—Inches	Diameter of Crankshaft Inches
Briggs and Stratton Co. Milwaukee, Wis.	P...	1 -2200	4	1	2½x2½	1600-2200	Vert.	12.27	No..	L...	3/32	5/32	1	5/16	Wedge..	5.4	2½	2	.156	No..	5/16	5/16	5¾	1	5/16	7/8	7/8	1
Cushman Motor Works Lincoln, Neb.	44	4 - 800	4	1	4 x4	400- 900	Vert.	50.25	No..	L...	1⅜	7/16	1 1/16	¼	Mush-room	..	4⅝	3	9/32	No..	4¾	1¾	6¾	2	1	1⅜	1⅜	1⅜
Evinrude Motor Co. Milwaukee, Wis.	..	1½- 900	2	1	2⅝x2½	900	Vert.	.....	No..	..	...	..	...	..	.....	..	...	3	5/16	.....	...	...	...	5/8	...	1¼	7/8	7/8

Abbreviations: R. P.—Rotary Pump; **P. P.**—Piston Pumps; **C. S.**—Circular Splash; **G. S.**—Gravity Splash; **W. G.**—With Gas; **P. S.**—Pressed Steel; **S. S.**—Semi-Steel; **O. F.**—Own Flywheel.

Farm Tractors for 1922—Continued

SYSTEM			Electrical	CLUTCH		TRANSMISSION						WHEELS				FRAME			Name and Model
Fuel Feed	Fuel Tanks and Capacities, Gals.	Air Cleaner, Make	Ignition System Make	Make	Type	Make of Transmission	Number Forw'd Speeds	Final Drive	Differential Lock	Drive Wheel Axle Type	Steering Type	No. Driving Wheels	Diameter and Face, Ins.	No. of Tracks	No. of Non-Drive Wheels	Material	Wheel-base, Ins.	Total Weight, Lbs.	
Gr....	2-1G-24K...	Optional...	Dixie.....	T.D....	D.D....	Own.....	2	Hub....	Yes.	Dead.....	Knuckle...	2	36x16	....	2	Struct...	81⅞	5,200	**Tioga**
Pump.	1-16K.....	Own.....	K.W.....	Own....	Shoe...	Own.....	2	Spoke...	No..	Dead.....	Knuckle...	2	54x10	....	2	Struct...	91	5,710	**Titan (I.H.C.)**
Gr....	1-25G.....	Bennett...	Eisemann...	Hilliard .	D.O....	Own.....	3	Rim....	No..	Dead.....	Swinging..	4	42x12	....	....	Struct...	100	7,800	**Topp-Stewart** B
Gr....	1-11G.....	Donaldson.	.....	Own....	Cont....	Own.....	2	Spoke...	No..	Dead.....	Knuckle...	2	41x6	....	2	None...	54	2,600	**Toro**
Pres..	1-12K.....	Optional...	K.W.....	Own....	Shoe...	Own.....	1	Axle....	No..	Live.....	Knuckle...	2	48x12	....	2	Struct...	84	4,500	**Townsend**
Pres..	1-18K.....	Optional...	K.W.....	Own....	Shoe...	Own.....	1	Axle....	No..	Live.....	Knuckle...	2	56x18	....	2	Struct...	90	6,500	**Townsend**
Pres..	1-35K.....	Optional...	K.W.....	Own....	Shoe...	Own.....	1	Axle....	No..	Live.....	Knuckle...	2	60x24	....	2	Struct...	110	.....	**Townsend**
Vac...	2-5G-55K...	Pomona...	K.W.....	Own....	Plate...	Own.....	2	Rim....	No..	Dead.....	.....	....	.....	2	....	Struct...	....	.....	**Tracklayer** 60
Gr....	1-12G.....	Oren.....	Dixie.....	B.&B...	D.D....	Own.....	1	Rim....	No..	Dead.....	Knuckle...	4	38x10	....	2	Struct...	76	1,750	**Traylor**
Gr....	2-3G-26K...	Own.....	Bosch.....	Hilliard .	Plate...	Own.....	2	Axle....	No..	Live.....	.....	....	.....	2	....	None...	....	9,200	**Trundaar**
Gr....	2-1½G-23K.	Bennett...	Bosch.....	T.D....	D.D....	Own.....	2	Axle....	No..	Live.....	Knuckle...	2	50x12	....	2	Cast....	84	4,660	**Twin City**
Gr....	2-1½G-40K.	Bennett...	Bosch.....	T.D....	D.D....	Own.....	2	Axle....	No..	Live.....	Knuckle...	2	60x20	....	2	Cast....	97	8,440	**Twin City**
Gr....	2-10G-95K..	.....	K.W.....	Own....	Cont....	Own.....	1	Rim....	No..	Rev.....	Knuckle...	2	84x24	....	2	Struct...	144	23,700	**Twin City**
Gr....	1-20G or K.	Bennett...	Brlng.....	T.D....	D.D....	Own.....	2	Axle....	No..	Live.....	Knuckle...	2	48x12	....	2	Pressed..	84	3,560	**Wallis** K
Gr....	2-1G-20K...	.....	Dixie.....	Own....	Cont....	Own.....	2	Rim....	No..	Rev.....	Knuckle...	2	52x12	....	2	Struct...	88	5,910	**Waterloo Boy** N
Gr....	2-10G-20K...	R.W.....	Dixie.....	T.D....	D.D....	Foote....	2	Spoke...	No..	Rev.....	Knuckle...	2	48x12	....	2	Struct...	85½	4,500	**Wellington** B
Gr....	2-10G-15K...	R.W.....	Dixie.....	T.D....	D.D....	Foote....	2	Axle....	No..	Live.....	Knuckle...	2	48x12	....	2	Struct...	75½	5,000	**Wellington** F
Gr....	2-2G-12K...	.....	.....	Fuller....	D.O....	Fuller....	3	Spoke...	No..	Dead.....	Knuckle...	2	46x10	....	2	Struct...	74	2,900	**Wetmore**
Gr....	2-2G-15K...	.....	.....	Own....	Cont....	Own.....	3	Axle....	No..	Live.....	Knuckle...	2	48x10	....	2	Pressed..	81	3,000	**Whitney** B
Gr....	2-½G-28K...	Bennett...	.....	T.D....	D.D....	Nuttall...	2	Axle....	No..	Live.....	Knuckle...	2	48x12	....	2	Struct...	93⅛	6,000	**Wichita** T
Gr....	2-5G-25K...	Optional...	.....	T.D....	D D....	Foote....	2	Rim....	No..	Rev.....	Knuckle...	2	52x12	....	2	Struct...	90	5,440	**Wisconsin**
Gr....	2-5G-25K...	Optional...	.....	T.D....	D.D....	Foote....	2	Rim....	No..	Rev.....	Knuckle...	2	52x12	....	....	Struct...	92	7,800	**Wisconsin**
Gr....	2.....	Pomona...	Bosch.....	Paragon.	D.D....	Own.....	2	.....	No..	.....	Swinging..	....	.....	2	....	Struct...	90	5,680	**Yuba**
Gr....	2-4G, 21D...	Pomona...	Bosch.....	Paragon.	D.D....	Own.....	2	.....	No..	.....	Swinging..	....	.....	2	....	Struct...	....	9,980	**Yuba**
Gr....	2-8G-38K...	Pomona...	Bosch.....	Paragon.	D.D....	Own.....	2	.....	No..	Dead.....	Swinging..	....	.....	2	....	Struct...	....	9,980	**Yuba**
Vac...	2-5G-25K ...	Leonard...	Bosch.....	B.&B...	D.D....	Own.....	4	Rim....	No..	Rev.....	Knuckle...	2	.....	....	2	Struct...	72	3,800	**Zelle**

Hori—Horizontal; **H-B**—Horizontal Bars; **Hol.-CS.**—Hollow Crankshaft; **K**—Kerosene; **Mech**—Mechanical Lubricator; **O**—Oil; **Pres**—Pressure; **Rev**—Revolving; **S-J**—Shotwell-Johnson; **Struct**—Structural Steel; **T-D**—Twin Disk; **Throt**—Throttle; **Vac**—Vacuum; **W**—Water.

Specifications — 1922

Carbureter, Make	Type and Size	Fuel Tank Capacity (Gallons)	Air Cleaner, Make	Type	Cooling Medium	Water Capacity (Gallons)	Circulation of Cooling Medium—Fan, Pump, Thermo-siphon	Belt Pulley			Clutch-Make, Type	Number of Speed Changes	Plowing and Cultivating Speed, Miles per Hour	Gear Reduction—Engine to Drive Wheels	Final Drive Method—Belt, Chain, Spur, Internal, Worm, Open-Inclosed	Wheels			Steering Arrangement—Handles, Clutches, Foot Bar, Wheel	Frame—Built-up, Cast Integral	Handle Bars—Rigid, Spring Mntd	Draw Bar—Rigid, Adjustable	Implements, Make	Manner of Attachment—Single Pnt Universal, Separate Attchmnt	Size Plow Recommended (Ins.)	Lawn Mower Attachment—Make, Size, Number (Inches)	
								Diameter	Face	R.P.M.						Number of Driving	Diameter, Face (Ins.)	Non-Driving—Number Diameter, Face (Inches)								
B. & S...	¾	1	Own.....	Dry..	Air..	...	Fan..	3¼	1¾	250	Own pos..	1	1 --	80	Wrm. incl....	2	21 x3⅜	2- 7x2	Hndl...	Int....	Rig..	Rig. Adj.	Std.....	Univ.	4-6	1-36
Schebler.	D-½	1	Own.....	.....	Air..	...	Fan..	3	3	Direct	Own pos..	1	1 -2½	40	Intl. incl....	1	20 x5	.....	Hndl...	Int....	Rig..	Adj.....	Std.....	.....	5	Std. 1-30
Kingston	L-¾	1½	Donaldson.	Dry..	Wtr.	1¼	T. S..	4½	3¼	1000	Own D.C.	1	¾-2½	35.4	Spur. incl....	2	25 x3¼	2- 9x3	Hndl...	Int....	Sprg.	Adj.....	Std.....	SinU.	8	Std. 3-84
Holley...	.....	3	Own.....	Dry..	Air..	...	Fan..	4	6	800	Dry disc..	1 & R.	1 -2½	34	Chn. incl....	2	28 x4	2	Hndl...	B.U...	Rig..	Rig. Adj.	Std.....	Sing..	9-10	Std.
Own....	½	1	Own.....	Dry..	Air..	....	None	None	...	.....	None.....	1	1½-4	24, 30	Chn. & in. inc	1	20 x3½	2	Hndl...	B.U...	Rig..	Rig. Adj.	Own std.	.....	6	Own 1-20
B. & S...	¾	½	Donaldson.	Dry..	Air..	....	Fan..	3	2	200	Own.....	1	¾-3	.....	Chn. open...	2	16 x3	2-12x1	Hndl...	B.U...	Rig..	Adj.....	Std.....	Snap.	None	Std. 1-30
Holley...	⅞	1½	Own.....	Wet..	Wtr.	1½	T.S...	4⅝	3½	.....	Own D.C.	1	1 -4	35	Int. incl.....	2	24¾x4, 8	2-14x3	Hnd. C.	C. Int.	Sprg.	Adj.....	Std.....	Sing..	10	Std. 3-30
Holley...	⅞	1½	Own.....	Wet..	Wtr.	1½	T.S..	4⅝	3½	.....	Own D.C.	1	1 -4	35	Int. incl.....	2	24¾x4, 8	2-14x3	Hnd. C.	Int....	Sprg.	Adj.....	Std.....	Sing..	10	Std. 3-30
Kingston	L-¾	2	Bennett...	Dry..	Wtr.	3	T.S.	5½	4¼	1500	Band.....	1	2 -2¼	62.5	Spur. incl....	2	32 x4	2-16x3	Hndl...	Int....	Sprg.	Rig.....	Own std.	.....	9	Std. 3-30

Engine Specifications

Number of Crankshaft Bearings	LENGTH CRANKSHAFT BEARINGS INCHES			Camshaft Diameter Inches	Is Cylinder Offset	Amount of Offset—Inches	Carburetor Size—Inches	Intake Manifold Integral with Exhaust—Separate	Cooling Medium	Cooling Medium Circulation	Lubrication System Splash With Fuel	Material of Crankcase	Material—Lower Half of Crankcase	Material of Cylinders	Material of Pistons	Maximum Horsepower Developed at R.P.M.	Maximum Torque Developed at R.P.M.	Is Governor Fitted	Governor Type	Governed Speed—R.P.M.	Maximum Brake Horsepower Average Product	Weight Engine Less Ignition and Carburetor Pounds	Overall Width of Engine Inches	Overall Height of Engine Inches	Overall Length of Engine Inches	Points of Engine Support	Fuel Recommended	Ignition System Battery-Magneto	Make of Ignition System	Spark Plug Size
	Front	First Int.	Rear																									
2	1⅛	.	1⅜	1	No..	..	½	Sep.	Air...	Fan....	C. S.	C.I....	P. S.	S. S.	S. S.	2400	1250	No...	.....	...	1	36	9½	17	10½	4	Gas.	Mag..	O. F.	Metric..
2	3 11/32	.	3 11/32	⅝	Yes.	⅜	1	Sep.	Water.	R. P.	G. S.	C.I....	C.I....	C.I....	C.I....	....	....	Yes..	Flyball.	800	4.17	190	16¾	22¾	21½	4	Gas.	Both..	Dixie.	½" Pipe
2	3	.	4	...	.....	..	...	....	Water.	P. P.	W. G.	C.I....	C.I....	C.I....	C.I....	1200	....	.....	.....	...	....	35	12⅝	16⅞	17 1/16	4	Gas.	Mag..	O. F.	⅞"-18..

Abbreviations: **R. P.**—Rotary Pump; **P. P.**—Piston Pumps; **C. S.**—Circular Splash; **G. S.**—Gravity Splash; **W. G.**—With Gas; **P. S.**—Pressed Steel; **S. S.**—Semi-Steel; **O. F.**—Own Flywheel.

British Agricultural Tractor Practice

Depression of agricultural industry during 1921 discouraged development. Chain tracks and three wheels have only one representative each. Only eleven makers in all. Two self-contained motor plows represented

By M. W. Bourdon

THE depressing conditions under which agriculture labored during last year resulted in the British tractor industry coming almost to a standstill; so much so that two or three makers who had previously been enthusiastic in their merchandising methods ceased advertising, manufacturing, and apparently gave up all endeavors to sell tractors for the time being. Whether they will launch out again with the original or new designs when industrial conditions improve remains to be seen; as they are concerns with other products beyond tractors, they are in a position to lie dormant on this side for a while.

While only a minority of British tractor makers have thus been content to take things lying down, the others, despite their continued efforts toward promoting sales, have not seen fit to vary their designs except in very small details. Austin has been the most energetic on the sales side—despite financial troubles—and has been as successful as any. This type of machine, a lightweight, frameless, is one appealing to a large proportion of British farmers, whose fields in most parts of the country rarely exceed 25 to 30 acres in extent. This fact accounts for the popularity of the Fordson. The Austin engine, it will be noted, is ¼ in. less in the bore than the Fordson, but the tractor does not appear to suffer on this account in respect of either performance or popularity; its engine has a slightly higher normal speed than that of the other, and probably develops approximately the same brake-horsepower—it has, in fact, the highest normal engine speed of any British machine, viz., 1500 r.p.m.

Chain track machines are less popular than ever among British makers; the Martin of this type has been discarded, its place being taken by a four-wheeler with a 4¼ x 5½-in. Galloway engine. The only British creeper now made is the Blackstone, which has a three-cylinder engine starting and running on kerosene, the fuel being injected into the combustion chamber separately from the air, which enters at a pressure of 80 to 90 lb. per square inch. A low-tension magneto is used, and a system of starting by compressed air is provided.

The Peterboro, with a Ricardo-designed engine, having that engineer's trunk pistons, has, like all agricultural tractors, been under a cloud during the past 12 months and has not had a fair opportunity of showing its worth from the practical and merchandising standpoint since it was first introduced at the 1920 trials. It is one of the heaviest of British tractors of modern design, weighing 5600 lb. with its 4¾ x 5½-in. engine. Beyond the design of the latter, the machine has no unusual features.

The Saunderson Junior machine put forward at the same time as the Peterboro has been temporarily held off the market until sales conditions improve, and only the original two-cylinder heavy model of this make is now being made. This is a pre-war design which has sold well in the past and given good service. It is, however, a general purpose tractor, and is offered as entirely suitable for road traction as well as for plowing and cultivating.

At one time there was a tendency among British makers to design for general traction purposes and fit springs fore and aft to accord with the national regulations concerning road vehicles. But that policy appears to have lapsed almost completely.

Two makes of self-contained motor plows now represent this type of machine in the British industry, the Crawley and the Fowler. Two others have dropped out during the past 12 months.

From the foregoing it will be realized that, so far as design is concerned, and also to a very great extent in respect of sales, British tractors have been almost stagnant during 1921, and, although Austin for one will this year attempt to liven up this side of his organization, the prospects of makers who contemplate development in design and output during 1922 are by no means promising at the moment.

British Agricultural Tractors 1922

MAKE	Make of Engine	No. of Cyls. Bore and Stroke (Ins.)	Normal R.P.M.	Lubrication System	Type of Oil Pump	Fuel	Type of Clutch	Final Drive Gears	No. of Wheels: Driving	No. of Wheels: Non-Driving	Driving Wheels Diameter and Width (Ins.)	Wheelbase (Ins.)	Driving Axle	Frame	Weight (Lbs.)	Water Injected	Air Cleaner Type	BELT PULLEY: Diameter (Ins.)	BELT PULLEY: Width (Ins.)	BELT PULLEY: R.P.M.	BELT PULLEY: Position	Forward Speeds	TRACTOR SPEED M. P. H.: 1st	2nd	3rd	Rev.
Austin	Own	4-3¾x5	1500	Hol. c. s.	Gear	Opt	Cone.	Spur.	2	2	42x10	68	Live.	None	3136	No	Wet	24	6	360	Side.	2	2½	4¼	...	2
Blackstone	Own	3-5 x6½	750	Hol. c. s	Gear	Ker	Cone.	Spur.	ch. tr	..	.....	..	Sta.	Struct.	5400	Yes.	None.	10& 17	6	500	Frt.	3	2	3	3½	1½
Crawley*	Own	4-4½x5½	950	Hol. c. s.	Gear	Gas	Cone.	Spur.	2	1	48x 8	..	Sta.	Press'd.	4704	No	None.	14	6	550	Side.	2	3¾	2½	...	1½
Fowler*	Wauk	4-3¾x5½	1200	Hol. c. s.	Gear	Opt	Plate.	Spur.	2	1	54x 8	..	Sta.	Struct.	4480	No	Dry	8	4¾	1040	Side.	2	1¾	3	...	1½
Glasgow	Cont.	4-4½x5¼	1150	Circ. sp.	Piston	Ker	Cone.	Bevel	3	..	39x12[1] & 8[2]	75	Live.	None	4144	No	Dry	9	6	1150	Side.	2	2½	4½	...	1¾
Martin	Gall.	4-4¼x5½	1000	Circ. sp.	Piston	Ker	Cone.	Spur.	2	2	52x12	86	Sta.	Struct.	5600	No	Wet	18	6	450	Side.	2	2	3½	...	2
Omnitractor	Own	2-6½x9	750	Hol. c. s.	Gear	Ker	Cone.	Spur.	2	2	60x16	90	Sta.	Struct.	7500	Yes.	Dry	15	6	500	Side.	2	2¼	4½	...	2½
Peterboro	Ricar.	4-4¾x5½	950	Hol. c. s.	Piston	Ker	Cone.	Spur.	2	2	54x10	87	Live.	Struct.	5600	No	Dry	12	6	900	Rear.	2	1¾	2¾	...	1½
Saunderson	Dion	2-5½x8	750	Hol. c. s.	Gear	Ker	Cone.	Spur.	2	2	48x10	90	Live.	Struct.	5824	No	Dry	12	7	750	Side.	..	1½	2½	4¼	2½
Wallis (British)	Ruston	4-4¼x5¾	850	Circ. sp.	Gear	Ker	Plate.	Spur.	2	2	48x12	84	Live.	None	4212	Yes.	Wet	18	6¾	850	Side.	2	2½	3½	...	2½
Weeks-Dungey	Wauk	4-4¼x5¾	900	Circ. sp.	Gear	Ker	Plate.	Spur.	2	2	40x10	60	Live.	Struct.	3920	No	Dry	8	6	900	Rear.	3	1¾	2¾	4½	1½

*Self-contained motor plow.

Current Specifications Indicate Great Diversity in Airplane Design

Aeronautic industry is still too young and variety of uses too great for standardization or concentration on production of a few types. About half American planes listed are for commercial or passenger carrying purposes and twenty per cent are sport planes. Others mostly military types.

THERE is such great diversity in the design of modern airplanes that it is difficult to discover any marked trends by comparing the specifications given herewith with those published in these columns in former years. It is therefore easy to conclude that the aeronautic industry is far from settling down to the production of relatively standardized vehicles. In fact, aside from the production of an occasional sporting plane or one designed for some special character of service, and a few for passenger carrying purposes, there is but little business outside that placed with a few concerns by the Government.

Of the 31 American planes listed in the accompanying table of specifications, about half are intended for commercial and passenger service. Of these one, an experimental type, is designed for carrying 27 passengers, one twelve passengers, one six and the others from two to five, including the crew. Forty per cent of the remainder (20 per cent of the total) listed are sporting types, and the others are mostly military types designed by or for the Government and built by it in some instances. The largest of the American machines are designed to carry a useful load of about 5000 lbs., and the fastest, according to the figures given, are the two Curtiss machines. One of these, in fact, holds the speed record for a closed course, having won the Pulitzer Trophy last November when it flew 150 miles at an average speed of 176.3 miles per hour. It is interesting to note that the weight of the American machines varies from 5.24 lb. per hp. for the high speed machines to over 20 lb. for some of the slower and larger machines. On the other hand the wing loading varies from 5 lb. per sq. ft. to 13.75 lb.

Nearly all of the American machines are fitted with water-cooled engines.

The European airplanes listed are of an even greater diversity of design than the American machines. They range from the giant Caproni, designed to carry 100 persons, down to the single seaters. There are several machines designed to carry from 10 to 25 persons, among the largest of these being the Handley-Page, Morane-Saulnier, Breguet, Vickers-Vimy and Fiat.

Weights per hp. vary from 5.1 lb. for the Hanriot-Dupont (which is the fastest, according to the figures given, of all the machines listed) to 25.3, while wing loadings vary from 20.6 to 5.8 lb. per sq. ft. Of all the machines listed the Breguet and the P.R.B., an Italian plane, are credited with the largest range of action, each of these being capable of flying 1000 miles at high speed. without stop.

The airplane industry suffered more acutely from the industrial depression of 1921 than any other unit of the automotive industry. Conditions have been such during the past year that production has been practically at a standstill so far as many manufacturers are concerned. An upward swing is expected, however, during 1922.

Specifications of American Aircraft Engines 1921-1922

(Compiled for Automotive Industries by A. & D. R. Black)

Name and Model	CYLINDER DATA					Piston Displ., Cu. Ins.	RATING		Approx. Gals. Gas per Hour	CONSUMPTION PER B.H.P. HR. IN LBS.			WEIGHT IN LBS.			Brake M. E. P. Lbs. Sq. In.	Compression Ratio	Carburetor	Ignition	INSTALLATION DIMENSIONS IN INCHES				
																				Overall			Height Above Eng. Bed	Center to Center of Beds
	No.	Arrgt.	Cooling	Bore	Stroke		B.H.P.	Crank R.P.M.		Gas	Oil	Total	Dry Eng.	Jacket Water	Total					Length	Height	Width		
Aeromarine....U-6-D	6	Vert....	W...	4¼"	6½"	552.48	152	1750	12.95	.509	.031	.54	518	27	545	124.0	5.32	Zenith...	Dixie...	61¾	40⅝	23¼	24⅞	14
Aeromarine....U-8-D	8	V-60°...	W...	4¼"	6½"	736.67	195	1750	14.2	.471	.011	.482	554	36	590	124.0	5.32	Zenith...	Dixie...	52⅜	34⅛	32¾	22⅛	13¾
Curtiss.....CD-12	12	V-60°...	W...	4½	6"	1145.0	385	2000	32.1	.5	.015	.515	700	38	738	135.0	5.7	B&BorZ.	Berk....	58⅛	37½	28¼	21½	15¾
Curtiss.....C-G	6	Vert....	W...	4½"	6"	573.0	160	1750	13.3	.50	.015	.515	420	19	439	128.0	5.2	Zenith...	Berk....	57¾	40¾	23⅛	24⅛	15¾
Hall-Scott.....L-4	4	Vert....	W...	5"	7"	549.68	125	1700	12.0	.57	.029	.599	380	10¾	390¾	112.9	5.25	Stmbg...	Delco...	52	41¾	22	20¾	16
Hall-Scott.....L-6	6	Vert....	W...	5"	7"	824.67	200	1700	19.0	.55	.029	.579	530	16	546	112.9	5.25	Stmbg...	Delco...	65	44	18¼	20¼	16
Lawrence.....L-4	3	Radial..	A....	4¼"	5¼"	225.0	62	1820	5.25	.5	.03	.53	160	..	160	120.0	5.0	Stmbg...	Dixie...	22⅜ Dia.	35⅜ Dia.	35½ Dia.	....	.... Flange
Lawrence.....J-1	9	Radial..	A....	4½"	5½"	787.5	220	1800	18.7	.5	.03	.53	425	..	425	123.0	5.0	Stmbg...	Dixie...	36	43½	43½	....	19¼ B.C.
Packard.....825	8	V-60°...	W...	5"	5¼"	825.0	230	1800	18.5	.48	.03	.51	550	23	573	125.0	5.5	Pack....	Mag....	50⅞	38¹¹⁄₁₆	27⅝	22¹³⁄₁₆	14½
Packard.....1237	12	V-60°...	W...	5"	5¼"	1237.0	350	1800	30.0	.51	.03	.54	740	39	779	124.0	6.5	Pack....	Mag....	63¼	38¹³⁄₁₆	27⅝	22¹³⁄₁₆	14½
Packard.....2025	12	V-60°...	W...	5¾"	6½"	2025.0	582	1800	51.0	.52	.03	.55	1120	51	1171	126.0	5.5	Pack....	Mag....	72⅝	45¼	31½	26²³⁄₃₂	17¾
Steel Prod. Rausie E-6	6	Vert....	W...	5"	6"	707.0	175	1650	14.5	.50	.038	.538	540	25	565	119.0	5.5	Stmbg...	Dixie...	60	47	23½	30	15⅜
Union.....3-6	6	Vert....	W...	4¾"	6½"	691.0	125 App.	1400	11.0	.56	.018	.578	496½	..	....	109.0	5.5	Zenith...	Philb...	69½	53¼	24	30¼	16
War Dept.....W	18	W.....	W...	....	....	....	700	1700		General Data Not Released For Publication														
Wright.....E-2	8	V-90°...	W...	4.724	5.118	718.9	190	1800	15.0	.48	.02	.50	480	45	525	116.4	5.5	Stmbg...	Dixie...	49⅛	34⅛	33¹⁄₁₆	18¾	13¹⁄₁₆
Wright.....H-3	8	V-90°...	W...	5.512	5.906	1126.4	325	1800	26.7	.50	.02	.52	625	58	683	127.0	5.5	Stmbg...	Dixie...	51¾	39⅜	38⅛	23½	14¹¹⁄₁₆

Specifications of American and

(Compiled for Automotive In

Nationality Make and Model	GENERAL						ENGINE			WING AND TAIL DATA					
	Type	Use	Over-all Dimensons			Crew and Pass.	No.	Make	Total H.P.	Angle of Incidence		Chord		Span	
			Length, Ft.-In.	Height, Ft.-In.	Width, Ft.-In.					Upper deg.	Lower deg.	Upper, Ft.-In.	Lower, Ft.-In.	Upper, Ft.-In.	Lower, Ft.-In.
AMERICAN															
Aeromarine 40-U	PB Boat	PA	28-11 3/16	12- 7	48- 6	2	1	Aeromarine, U-6-D	130	3½	2	6- 3	6- 3	48- 6	37- 6
Aeromarine 44-U	PB Boat	PA	28-11 3/16	12- 7	48- 6	3	1	Aeromarine, U-6-D	130	3½	2	6- 3	6 -3	48- 6	37- 6
Aeromarine 50-U	PB Boat	PA	28-11 3/16	12- 7	48- 6	2	1	Aeromarine, U-8-D	180	4⅛	3	6- 3	6- 3	48- 6	37- 6
Aeromarine 75	TB Boat	C	49- 4	18- 9	103-9	12	2	Liberty, C	700	4	4	8- 0	8- 0	103- 9	74- 4
Aeromarine 80	PB Boat	C	38- 6	14- 7	74- 0	6	1	Liberty, C	350	5½	4	6- 3	6- 3	74- 0	....
Aerial Transport VBL-1	TB Land	C	39- 6	12- 3	57- 0	2	1	Liberty	400	0	0	7- 3	7- 3	57- 0	52- 0
**Bethlehem Baco Skylark	TB Land	SP	23- 0	8- 0	29-10 Folded	2	1	Lawrence	60	....	....	4- 0	4- 0	29-10	29-10
Barnhardt BT-15	TB Land	C	32- 6	10- 1½	22- 0	5	2	Curtiss, OX-5	180	....	....	5- 6	5- 6	49- 1	49- 1
Cox-Klemin, Mercedes-Standard	TB Land	PA	27- 4	10-10	43-11	3	1	Mercedes	190	2½	2½	6- 0	6- 0	43-11	31- 0
Cox-Klemin DH-6 Benz	TB Land	PA	28- 0	10- 9½	35-11	2	1	Benz	150	4	4	6- 4	6- 4	35-11	35-11
**Curtiss Cactus Kitten	TT Land	SP	19- 3	8- 6	20- 0	1	1	Curtiss, C-12	435	....	....	....	....	20- 0	20- 0
**Curtiss Navy Racer	TB Land	SP	20- 0½	8-11	22- 8	1	1	Curtiss, CD-12	405	....	0	4- 0	4- 0	22- 8	22- 8
Dayton-Wright FP-2	TB Seaplane	AP	36-10¼	14- 0	15- 5	4	2	Liberty, A	840	2	2	7- 0	7- 0	51- 5	51- 5
Elias TA-1	TB Land	Trn.	23- 0¾	9-11	32- 7	2	1	A-B-C Wasp	170	4	4	5- 8	5- 8	32- 7	32- 7
Heath, E. B.	TB Land	SP	18- 0	6- 6	24- 0	1	1	Heath	20	4	....	4- 0	4- 0	24- 0	....
Huff-Daland TA-2	TB Land	Trn	21- 6	....	35- 2	2	1	A-B-C Wasp	170	2	2	6- 0	4- 0	35- 2	35- 2
Kinner K-1	TB Land	PA	19- 0	7- 6	26- 3	2	1	Kinner	60	....	....	4- 0	4- 0	26- 3	26- 3
Loening 23	PM Boat	PA	29- 0	8- 0	43- 0 Folded	5	1	Liberty	400	4½	....	8- 0	....	43- 0	....
Martin, Glen L. MB-2	TB Land	B	43- 7 5/16	15- 6¾	37-10	3	2	Liberty	840	2	2	7-11	7-11	74- 2	74- 2
Martin, James V. K-4	TB Seaplane	MS	16-10	7- 1	24- 2	1	1	Lawrence	60	2	2	3- 3	3- 3	24- 2	2-4 2
Nebraska	TB Land	C	27- 0	11- 7	44- 7	3	1	Hispano-Suiza	....	....	....	6- 0	....	....	....
**Orenco Tourister II	TB Land	PA	....	9- 4	39- 0	5	1	Wright, E-2	190	2	2	5- 0	5- 0	39- 0	39- 0
Remington-Burnelli RB	TB Land	E & C	41- 2	18- 0	74- 0	27	2	Liberty	800	2	2	10- 6	10- 6	74- 0	74- 0
War Department GA-1	PT Land	AT	33- 7⅜	14- 3	65- 6	3	2	Liberty	800	1½	1½	6- 8	6- 8	65- 6	65- 6
War Department XBIA	TB Land	O	25- 6	9- 9½	39- 4 5/16	2	1	Wright-Hispano	300	1¾	1¾	5- 6	5- 6	39- 4 5/16	39- 4 5/16
War Department USD9A	TB Land	O	30- 2	11- 2	45-11	2	1	Liberty	400	2½	2½	5- 9	5- 9	45-11	45-11
Wittemann DHM2	TB Land	M	30- 2½	11- 5	48- 8	1	1	Liberty	400	3	3	5- 6	5- 6	48- 8	48- 8
**Waterman OX5	TM Land	SP	....	....	21- 9 Folded	1	1	Curtiss, OX-5	90	....	....	5- 6	....	21- 9	....
**Longren	TB Land	PA	19- 0¼	7- 8	9- 8	2	1	Anzani	60	3	2	4- 3	4- 3	27-11	21-11
Martin, Glenn L. GMB	TB Land	B	46-10	14- 7	71- 5	3	2	Liberty	800	2	2	7-10	7-10	71- 5	71- 5
Rogers Const. TAD-1	TB Land	SP	....	....	29- 0	....	1	Curtiss, OX-5	90	....	0	4- 6	4- 6	29- 0	29- 0
AUSTRIAN															
W. K. F. Co.—Sport-Plane	TB Land	SP	14- 4	....	17- 3	1	1	Haacke	35	....	....	3- 3	3- 3	17- 3	17- 3
Aviatik Co.—Phoenix	TB Land	F	25- 0	9- 7	36- 0	2	1	Hiero	230	4	3½	5- 6	4-11	36- 0	28- 2
Avia Co.—B. H.	TM Land	SP	19- 0	6- 8	35- 5	2	1	Austro Damler	40	....	....	4- 2	....	35- 5	....
Aero Co.—AE-2.01	TB Land	SP	17-10	8- 0	23- 8	1	1	Hispano-Suiza	220	....	....	4- 3	3- 3	23- 8	22- 6
BELGIAN															
Droesbeke Co.—Droesbeke	TB Land	SP	18- 6	....	18- 6	...	1	Hispano Suiza	300	....	....	3- 3	3- 3	18- 6	18- 6
BRITISH															
Armstrong—Siddeley Whitworth—Sinaia	TB Land	DB	....	....	....	....	2	Siddeley-Tigers	....	Details	withheld	by Eng.	Authorit	ies	
A. V. Roe—Antarctic	TB Seaplane	SP	22- 5	9- 7	26- 3	2	1	La Rhone	80	5.5	5.5	4- 0	4- 0	26- 3	24- 0
A. V. Roe—Avro-Lion	TB Land	SP	18- 2	8- 6	25- 6	1	1	Napier-Lion	450	....	....	4- 6	4- 6	25- 6	24- 6
Bristol Co.—Bristol Commercial	TB Land	C	42- 0	11- 0	54- 0	10	1	Napier-Lion	450	....	....	6-10	6-10	54- 0	54- 0
DeHaviland Co—DH-29	TM Land	C	43- 0	....	54- 0	14	1	Napier-Lion	450	....	....	12- 4 Tapered	....	54- 0	....
DeHaviland Co—DH-32	TB Land	C	39- 0	13- 6	50- 0	9	1	Rolls-Royce	360	3	3	6- 6	6- 6	50- 0	50- 0
Fairey Co.—Fairey III-D	TB Seaplane	F	36- 1	14- 6	46- 1	2	1	Rolls-Royce Eagle	360	....	....	5- 6	5- 6	46- 1	46- 1
Gloucestershire Co—Mars I or Bamel	TB Land	R	21- 0	....	23- 0	1	1	Napier-Lion	450	....	....	4- 9	4- 9	23- 0	23- 0
Handley-Page Co.—V-1500	2T2 PB Land	C	64- 0	23- 0	126- 6	25	4	Rolls-Royce Eagle	1400	....	....	13 -0	13- 0	126- 6	126-6
HandasydeCo.—300-Monoplane	TM Land	C	33 -3	9- 0	47- 0	6	1	Hispano-Suiza	300	....	....	Tapered	....	47- 0	....
HandasydeCo.—450-Monoplane	TM Land	C	39- 6	10- 2	57- 0	10	1	Napier-Lion	450	....	....	Tapered	....	57- 0	....
F. H. Lowe Co.—Marlburian	TM Land	S	16- 9	8- 4	27- 4	2	1	Gnome	60	....	....	5- 3	....	27- 4	....
Parnall Co.—Puffin-Amphibian	TB Seaplane	S	....	....	....	....	1	Napier-Lion	450	....	....	Det	ails	Withhel	d
Sage Co.—Sage No. 10	TB Amphibian	F	29- 3	12- 2	40- 0	2	1	Cosmos Jupiter	450	....	....	6- 9	5- 9	40- 0	26- 3
Supermarine Co.—Seal—MK II Amphibian	TB Boat	N	32-10	14-10	48- 0	3	1	Napier-Lion	450	3	3	7- 0	7- 0	48- 0	48- 0
Vickers—Saunders Valentia	TB Boat	C	58- 0	22- 0	112- 0	5	2	Rolls-Royce Condor	1200	5	5	10- 6	10- 6	112- 0	....
Vickers—Viking MK-IV	PBBoatAmphib	C or N	33- 6	15- 1	50- 0	5	1	Napier-Lion	450	6	6	7- 1	7- 1	50- 0	50- 0
Vickers—Vickers Vim	PB Land	Trn	32- 4	12- 4	47- 8	2	1	Rolls-Royce	360	4.25	4.25	5- 6	5- 6	47- 8	47- 8
Vickers—Vimy Ambulance	TB Land	A	42- 8	13- 3	68- 0	8-12	2	Napier-Lion	900	....	....	10- 6	10- 6	68- 0	68- 0
DUTCH															
N. A. V. O.—N. A. V.-6	TM Land	C	28-10	11- 2	45- 3	6	1	Benz	220	....	....	8- 4	....	45- 3	....
Netherlands—Fokker C-II	TB Land	C	24- 9	9- 5	23- 8	3	1	B. M. W.	185	....	....	....	....	23- 8	....
Netherlands—Fokker F-III	TM Land	C	33-10	10- 6	52- 6	6	1	Siddeley Puma	230	....	....	10- 4	....	52- 6	....
Van Berkel—W. B.	TM Seaplane	F	44- 6	14- 6	62- 0	2	1	Rolls-Royce Eagle	360	....	....	....	....	62- 0	....
FRENCH															
Breguet—Leviathan XX	TB Land	C	46- 0	16-10	83- 7	12	2	Bugatti	800	....	....	9- 6	9- 6	83- 7	83- 7
Buscaylet Co.—Amphibian	TM	C	83- 8	16- 5	136-0	....	3		1500	....	....	31-0 Tap	....	136- 0	....
Caudron—C-39	TB Seaplane	C	43- 0	14- 0	68- 6	6	3	Clerget	390	....	....	....	....	68- 6	68- 6
Caudron—C-60	TB Land	R	24- 7	....	33- 4	2	1	Clerget	130	....	....	....	....	33- 4	31- 4

ABBREVIATIONS—

*—Estimated
A—Ambulance
AT—Attack
B—Bombing
C—Commercial
DB—Day Bombing
E—Experimental
F—Fighting
L—Lower
M—Mail Carrier
Ms—Messenger
N—Naval
P—Pusher
PA—Passenger
PB—Pusher Biplane

**Taken from published data. All other data regarding American planes supplied by manufacturers.

Foreign Airplanes 1921-1922.

dustries by A. & D. R. Black)

WING AND TAIL DATA											WEIGHT IN LBS.							PERFORMANCE						
Areas in Square Feet																		High Speed			Climb		Service or	Range at
Wings Total —Ail's	Ailerons	Stabilizer	Elevators	Vert. Fin.	Rudder	Non-skid Planes	Gap Ft.-In.	Stagger In.	Sweepback deg.	Dihedral deg.	Empty	Gas and Oil	Useful Load	Total Gross	Useful % Gross	Lbs. per H.P.	Lbs. per Sq. Ft.	M.P.H.	Alt. Feet	Low Speed M.P.H.	Mins.	Feet	Approx. Ceiling (Feet)	High Speed (Miles)
504	58.0	39.0	25.6	15.0	17.5	None..	6- 6	8	None...	2	2,161	278	638	2,799	22.8	21.5	5.55	76.0	SL	44.0	10.0	2,400	....	....
504	58.0	39.0	25.6	15.0	17.5	None..	6- 6	8	None...	2	2,245	282	821	3,067	26.8	23.6	6.1	73.5	SL	50.0	10.0	2,500	....	200
504	58.0	39.0	25.6	15.0	17.5	None..	6- 6	12	None...	2	2,240	471	931	3,275	28.4	18.2	6.5	87.8	SL	52.2	10.0	3,500	....	300
1,397	119.0	120.9	53.3	34.7	33.5	31.1	8-10½	None...	None...	1½	8,456	1,587	4,367	12,823	34.0	18.3	9.2	85.0	SL	50.0	....	....	....	340
803	105.5	54.8	45.6	19.6	27.0	16.0	7- 6½	None...	None...	2	4,300	1,020	2,100	6,500	32.3	19.7	8.09	91.0	SL	51.0	10.0	2,500	....	570
749	85.0	68.0	44.0	8.8	23.5	None..	7- 3	None...	None...	1½	3,460	960	3,320	6,780	49.0	16.9	9.05	102.0	SL	48½	6.0	3,000	10,000	450
214	.....	.....	.....	.....	.....	.....	5- 0	20	None...	1½	700	.....	600	1,300	46.0	19.3	5.0	90.0	SL	33.0	1.0	600	18,000	.....
526	80.0	36.0	23.0	10.3	19.0	None..	6- 8	None...	None...	None...	2,611	540	1,420½	4,031½	35.2	22.4	7.67	90.0	SL	40.0	10.0	3,000	10,000	405
429	42.0	24.0	22.0	4.0	10.0	None..	6- 0	.....	5	1¾	1,815	210	735	2,550	29.0	13.4	5.9	93.0	SL	35.0	21.0	10,000	15,000	165
436	76.0	36.0	26.0	5.0	12.0	None..	5- 8½	None...	None...	2	1,695	210	555	2,050	27.0	13.65	4.7	85.0	SL	30.0	20.0	10,000	16,500	200
175	.....	.....	.....	.....	.....	None..	.....	None..	None...	.....	.....	.....	.....	2,406	.....	5.53	13.75	Est 196.0	SL	70.0	.....	.....	.....	228
186	18.0	12.6	9.2	4.8	4.8	None..	4- 0	15	None...	.....	1,735	.....	430	2,165	19.86	5.24	12.5	Est 190.0	SL	70.0	.....	.....	.....	.....
668	88.0	53.8	29.0	20.8	28.7	None..	7- 8½	None...	None...	2	5,726	916	1,862	7,588	24.5	9.02	11.35	Est 120.0	SL	63.0	10.0	5,000	18,000	250
337	.....	.....	.....	.....	.....	.....	5- 8	None...	.....	2	1,447	219	615	2,062	29.8	14.75	6.1	97.0	SL	.....	16½	10,000	16,000	145
165	20.0	5.0	7.0	2.5	4.0	None..	4- 0	15	None...	1½ low	350	45	200	550	51.0	27.5	3.25	60.0 78.5	2,000 10,000	29.0	1.0	800	5,000	55
318	.....	.....	.....	.....	.....	.....	.....	.....	.....	2½ low	1,386	242	602	1,988	30.3	14.2	6.25	85.6	SL	.....	29½	10,000	11,700	256
200	30.0	14.0	12.0	3.0	6.0	None..	4- 6	.....	None...	2	600	60	400	1,000	40.0	16.66	5.0	76.0	SL	35.0	60.0	12,000	10,000	150
330	22.0	23.5	19.0	24.0	16.5	.....	.....	.....	.....	.....	2,200	390	960	3,550	38.0	8.5	10.7	135.0	19,500	50.0	10.0	10,000	22,000	.....
1,121	130.0	62.25	43.2	17.6	38.5	None..	8- 6	None...	None...	2 low	7,057	1,965	5,018	12,075	41.5	14.4	10.76	100.0	SL	60.0	10.0	4,000	9,000	450
150	16.0	12.0	7.0	None..	6.0	5.0	3- 6	None...	None...	None...	685	75	265	950	28.0	15.83	6.33	80.0	SL	.....	.....	.....	.....	240
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
358	40.0	27.7	23.1	4.7	11.8	None..	5- 3	14½	None...	None...	1,847	.....	978	2,825	34.5	15.7	7.3	110.0	SL	49.0	23.0	10,000	.....	264
1,323	124.0	50.0	104.0	25.0	48.0	None..	10- 9	None...	4	1½ 0	9,040	2,130	5,000	16,170	32.0	22.0	12.0	115.0 95.0	SL 8,000	48.0	10.0	5,000	14,000	630
1,016	.....	.....	.....	.....	.....	.....	5- 0	None...	None...	1½ 3	7,532	675	2,208	9,740	22.7	11.0	9.6	105.0 126.0	SL 10,000	.....	22.8	8,000	9,600	183
405.6	.....	.....	.....	.....	.....	.....	5- 5	18	.....	3½	2,010	341	984	2,994	32.8	8.85	7.4	133.0 117.6	SL 10,000	.....	10.0	10,000	20,900	319
514	.....	.....	.....	.....	.....	.....	6- 1½	13½	.....	2	2,815	933	1,507	4,322	34.8	9.9	8.4	126.2	SL	.....	13.25	10,000	18,700	855
500	73.2	37.2	23.6	5.6	15.8	None..	6- 0	9	None...	3	3,060	903	1,940	5,000	38.8	12.5	10.0	122.0	SL	50.0	9½	8,000	15,600	426
112	16.0	12.0	10.0	1.5	5.0	None..	.....	.....	None...	None...	885	86	245	1,130	21.7	12.5	11.1	130.0	SL	60.0	.....	.....	.....	.....
189	19.1	13.5	11.4	2.6	5.6	None..	.....	None...	None...	3	550	.....	500	1,050	47.5	17.5	5.55	.....	.....	.....	.....	.....	.....	.....
1,070	.....	.....	.....	.....	.....	.....	8- 4	None...	.....	None...	6,702	1,415	2,483	9,185	27.2	11.45	8.6	96.2 106.0	10,000 SL	.....	22.6	10,000	12,600	450
252	36.0	19.0	17.0	5.0	9.0	None..	5- 0	15	None...	2	1,142	142	573	1,815	20.0	19.7	7.2	85.0	SL	44.0	21.0	5,000	8,000	.....
101	6.0	8.0	4.5	3.0	3.5	None	3-4	21	None	{U 0 {L 2	....	150	....	740	....	21.0	7.4	81.0	SL	.....	....	....	....	400
247	17.2	....	12.9	....	7.5	None	5-3	22	None	....	1,800	280	930	2,730	34.0	11.9	11.0	113.0	SL	....	20.5	10,000	....	300
116.2	....	....	....	....	....	None	....	....	None	Tapered	582	90	430	1,012	42.5	25.3	8.7	70.0	SL	....	10.0	3,300	....	250
172.2	....	....	....	....	....	None	4-3	8	None	{U-1 {L-2	1,200	....	710	1,910	32.0	8.7	11.1	136.0	SL	.....	....	....	....	....
122	....	....	....	....	....	None	4-3	14	None	....	1,410	....	520	1,930	26.9	6.4	16.0	177.0	SL	68	....	....	23,000	....
....	....	....	....	....	....	None	....	None	None	....	....	....	....	....	....	....	....	....	....	.....	....	....	....	....
184.5	....	14.5	7.0	....	7.5	None	4-3	18	None	2.5	1,000	160	600	1,600	37.5	20.0	8.7	90.0	SL	43	15.0	5,000	....	350
....	....	....	....	....	....	None	4-6	None	None	U-0			Detail	s Wit	hheld									
672	....	....	....	....	....	None	5-9	None	None	L-3	3,900	800	2,900	6,800	42.6	15.1	10.1	122.0	SL	.....	22.0	10,000	13,500	400
440	....	54.0	31.0	9.0	16.2	None	....	....	Tapered	Tapered	4,350	....	3,150	7,500	42.0	16.7	17.1	.....	....	.....	....	....	....	....
681	23.0	56.0	24.2	6.4	18.0	None	6-10	None	None	3	3,412	800	2,326	5,738	40.0	15.9	9.3	110.0	SL	.....	27.5	10,000	14,000	400
500	....	27.2	19.2	9.0	14.5	None	5-7	....	None	....	3,990	825	1,060	5,050	21.0	14.0	10.0	110.0	SL	.....	6.7	5,000	17,000	500
205	....	....	....	....	....	None	4-9	16	None	....	1,890	425	610	2,500	24.4	5.5	12.2	163.0	SL	....	....	....	....	320
3,220	....	....	....	....	....	None	15-0	None	None	....	15,800	7,800	12,200	28,000	43.5	20.0	8.7	100.0	SL	50	8.0	5,000	....	900
375	....	....	....	....	....	None	....	....	Tapered	None	2,450	750	1,750	4,200	41.6	14.0	11.2	112.0	SL	45	5.0	3,000	15,000	500
540	....	....	....	....	....	None	....	....	Tapered	None	4,100	900	2,900	7,000	41.5	15.5	13.0	125.0	SL	45	5.0	3,000	15,000	450
107	18.0	8.8	9.8	1.8	4.6	None	....	....	None	2.5	450	....	....	....	....	....	....	100.0	SL	33	....	....	....	240
by	Englis	h Au	thoriti	es		None	....	....	None															
390	31.0	46.0	28.0	12.5	8.5	None	6-0	22	None	2	....	....	....	....	....	....	....	110.0	SL	....	10.0	10,000	16,500	400
644	....	....	....	....	....	None	....	....	None	3	.....	.....	1,790	.....	.....	.....	.....	104.0	SL	45	....	....	....	520
2,000	....	....	....	....	....	Yes	10-0	....	None	1.5	10,550	4,400	7,750	18,300	42.4	15.3	9.1	110.0	6,000	.....	9.5	6,000	....	800
636	....	35.0	25.0	11.0	14.0	None	7-7	None	None	U-0 L-5	3,740	650	1,935	5,675	34.1	12.6	8.9	118.0	SL	50	3.3	3,000	17,000	480
488	69.0	52.0	29.0	2.6	13.0	None	6-1	None	None	4	2,950	335	695	3,645	19.0	10.1	7.5	100.0	SL	45	8.2	6,000	13,000	200
1,330	24.2	11.4	63.0	27.0	21.5	None	10-0	None	None	4	7,800	1,340	4,070	11,870	34.3	13.2	8.9	109.0	6,500	50	10.0	6,500	....	545
395	....	....	....	....	....	None	....	....	Tapered	Tapered	2,640	400	1,100	3,740	29.4	17.0	9.5	100.0	SL	.....	....	....	....	450
290	....	....	....	....	....	None	....	....	None	.....	1,820	300	780	2,600	30.0	14.0	9.0	115.0	SL	45	5.0	3,300	....	450
473	30.5	21.0	25.8	....	14.0	None	....	....	Tapered	Tapered	2,815	700	1,705	4,520	37.7	19.7	9.6	105.0	SL	.....	.....	.....	.....	500
....	....	....	....	....	....	None	....	....	None	2.0	....	1,170	2,100	....	....	....	....	112.0	SL	50	17.0	6,800	12,000	940
1,500	....	77.0	88.6	44.0	21.5	None	11-8	None	3.5	4.0	5,720	3,300	8,180	13,900	58.8	17.4	9.3	118.0	SL	55	20.0	6,500	14,800	1,000
3,120	....	....	....	....	....	None	....	....	Tapered	Tapered	14,100	....	12,300	26,400	46.5	17.6	8.5	110.0	SL	.....	....	....	18,700	....
954	....	....	....	....	....	None	....	None	None	{U-0 {L-3	....	800	....	6,750	....	17.3	7.1	80.0	SL	.....	....	....	....	320
270	....	....	....	....	....	None	....	None	None	{U-0 {L-2.5	1,110	....	790	1,900	41.5	14.6	7.0	....	....	.....	••..	....	....	....

PM—Pusher Monoplane
PT—Pusher Triplane
R—Racer

S—Scout or Pursuit
Sp—Sport
STP—Scout Torpedo Plane

Trn—Training
Tap—Tapered
T—Tractor

TB—Tractor Biplane
TM—Tractor Monoplane
TT—Tractor Triplane

TP—Torpedo Plane
TF—Trench Fighter
U—Upper

Specifications of American and For

Nationality, Make and Model	GENERAL						ENGINE			WING AND TAIL DATA					
			Over-all Dimensions							Angle of Incidence		Chord		Span	
	Type	Use	Length, Ft.-In.	Height, Ft.-In.	Width, Ft.-In.	Crew and Pass.	No.	Make	Total H.P.	Upper deg.	Lower deg.	Upper, Ft.-In.	Lower, Ft.-In.	Upper, Ft.-In.	Lower, Ft.-In.
FRENCH (Concluded)															
Ernoul—F. A. T. M.—A-2	TM Land	C	43- 0	....	72- 0	8	2	Salmson	460	....	....	Tapered	....	72- 0	....
Hanriot-Dupont—HD-22	TM Land	R	18- 9	7-10	21- 0	1	1	Hispano Suiza	320	....	....	....	....	21- 0	....
Farman—Levy	IP ZT B Boat	B	59- 0	....	108- 6	4	3	Panhard	1050	....	....	11-10	11-10	108- 6	....
Latham—Multi-Engine	2T-2P B Boat	C	60- 0	16- 0	104- 0	....	4	Salmson	1000	....	....	....	....	104- 0	78- 0
Nieuport Delage—30-T	TB Land	C	....	....	59- 0	8	1	Sunbeam	420	....	....	9-10	8- 4	59- 0	42- 8
Delage—Sea Qui-Plan	TM Land	R	20- 0	6- 8	26- 4	1	1	Hispano-Suiza	300	2	....	4-11	....	26- 4	....
S. P. A. D.—S-33 Berline	TB Land	C	29- 9	10- 6	28- 4	6	1	Salmson	250	....	....	....	....	38- 4	34- 2
Morane Saulnier — Cantilever Monoplane	TM Land	C	56- 8	10- 5	93- 0	18	5	Lorraine Dietrich	1110	....	....	19- 0	....	93- 0	....
Monge—Monge Monoplane	TM Land	R	23- 0	....	26- 3	1	1	Hispano-Suiza	300	2	....	Tapered	....	26- 3	....
Monge—Monge Biplane	TB Land	R	23- 0	....	26- 3	1	1	Hispano-Suiza	300	2	2	Tapered	Tapered	26- 3	18- 0
Potez—VIII R	TB Land	SP	19- 5	8- 2	26- 3	2	1	Le Rhone	80	....	....	4- 6	4- 6	26- 3	23- 6
Potez—IX	TB Land	C	32- 0	10- 7	46- 3	5	1	Lorraine Dietrich	370	....	....	....	....	46- 3	46- 3
Potez—X	TB Land	C	40- 4	14- 3	60- 2	11	3	Hispano-Suiza	420	0	0	9- 3	9- 3	60- 2	56- 0
Spad—Spad Navy	TB Land	N	26- 0	....	34- 4	2	1	Hispano-Suiza	275	....	....	7- 8	5- 6	34- 4	30- 3
Wibault—3-C-1	TM Land	S	27-11	....	37- 5	....	1	Hispano-Suiza	300	....	....	....	....	37- 5	....
Wibault—2-B N-2	TB Land	C	41-10	....	55- 5	12	1	Renault	600	....	....	10- 2	10- 2	45- 3	55- 5
GERMAN															
Albatros—W-10	PM Boat	C	31-10	6- 6	45- 9	4	1	Mercedes	120	....	....	7- 0	....	45- 9	....
Albatros—Commercial	TM Land	C	34- 1	11- 7	52- 6	8	1	B. M. W	185	....	....	11- 6	....	51- 0	....
Dornier—C-I	TB Land	F	24- 5	8- 8	34- 6	2	1	Mercedes	160	....	....	5- 0	5- 0	34- 6	30- 0
Dornier—C-III	TM Land	C	29-10	8- 3	55- 9	6	1	B. M. W	185	....	....	9-10	....	55- 9	....
Dornier—CS-I	TM Seaplane	F	....	....	....	2	1	Benz	195	....	....	....	....	....	....
Dornier—CS-II	TM Boat	C	33- 2	9- 0	55- 9	6	1	B. M. W	185	....	....	9-10	....	55- 9	....
Dornier—D-I	TB Land	F	....	....	....	1	1	B. M. W	185	....	....	....	....	....	....
Dornier—Dragon Fly	TM Boat	SP	23- 6	7- 5	27- 7	3	1	Siemens-Halske	60	....	....	5- 5	....	27- 7	....
Dornier—G-I	TM Land	C	40- 0	10-11	69- 0	9	2	B. M. W	370	....	....	13- 1	....	69- 0	....
Dornier—GS-I	IP-IT M Boat	C	50- 3	14- 2	69- 0	8	2	Maybach	520	....	....	14- 2	....	69- 0	....
Dornier—GS-II	IP-IT M Boat	C	54- 0	14- 2	74- 0	8	2	Maybach	520	....	....	14- 2	....	74- 0	....
Dornier—Zeppelin Monoplane	TM Land	C	33- 0	11- 0	62- 8	8	2	Argus	240	....	....	....	....	62- 8	....
Dornier—Sport	TM Boat	SP	23- 6	7- 5	28- 2	3	1	Stern	60	....	....	5- 5	....	28- 2	....
Hawa—F-10	TT Land	C	28-10	12-10	37-10	5	1	Benz	220	....	....	UL 5.7	M 3.11	....	37-10
L. F. G.—V-3A	PM Boat	C	31- 0	7- 8	47- 4	3	1	B. M. W	185	....	....	7-10	....	47- 4	....
L. F. G.—V-8	PB Boat	C	27- 5	9- 5	44- 5	3	1	Mercedes	120	....	....	....	....	44- 5	44- 5
L. F. G.—V-13 Strella	TB Seaplane	C	35-10	12- 9	57- 6	4-6	1	Benz	220	....	....	....	....	57- 6	57- 6
L. F. G.—V-18 Sassnitz	PB Boat	C	33- 5	10-10	54- 0	6	1	Mercedes	160	....	....	....	....	54- 0	54- 0
L. F. G.—V-20 Arkona	TM Seaplane	C	30- 2	10- 9	42- 2	4	1	Benz	150	....	....	....	....	42- 2	....
L. V. G.—G-300	TT Land	C	33- 7	12-10	80- 4	....	2	Maybach	520	....	....	....	....	80- 4	....
Rieseler—Sport	TM Land	SP	18- 9	....	23- 0	1	1	Haacke	30	2	....	5- 6	....	23- 0	....
Sablatnig—C-3	TM Land	F	28- 6	....	44- 7	2	1	Maybach	260	....	....	8-10	....	44- 7	....
Sablatnig—P-1	TB Land	C	29- 3	11- 4	36- 1	5	1	Benz	200	....	....	....	....	36- 1	....
Sablatnig—P-3	TM Land	C	29- 4	10- 8	52- 6	6	1	Maybach	260	....	....	....	....	52- 6	....
S. W. S.—C-1	TB Land	F	25-10	9- 7	38- 0	2	1	B. M. W	185	....	....	5- 7	4- 5	38- 0	35-11
ITALIAN															
Ansaldo—A-300-2	TB Land	SP	28- 0	9- 9	36-10	3	1	Fiat	300	....	....	....	....	36-10	36- 0
Ansaldo—Balilla	TB Land	R	22- 6	9- 0	26- 0	1	1	Curtiss K-12	400	....	....	....	....	26- 0	....
Ansaldo—IX	TB Land	SP	28- 0	9- 6	30- 3	2	1	S. P. A	220	....	....	....	....	30- 3	....
Caproni—Capro-Nissimo	4P-4T Triple Triplane Boat	C	74- 0	31- 6	100- 0	100	8	Liberty	3200	....	....	U M L 9-0		U M L	100-0
Fiat—Commercial	TB Land	C	43-10	14- 9	69-0	11	3	Fiat	900	....	....	10- 6	10- 6	69- 0	....
Fiat—BR	TB Land	C	32- 3	12- 6	50-10	..	1	Fiat	700	....	....	7- 8	7- 8	50-10	....
Fiat—R-2	TB Land	F	28- 8	10-10	40- 5	2	1	Fiat	300	3.5	3.5	....	....	40- 5	40- 5
Nieuport-Macchi.—M-7	PB Boat	N	26- 7	9-10	33- 2	1	1	Isotta Fraschini	250	....	....	....	....	33- 2	....
Nieuport Macchi.—M-9	PB Boat	S	30-10	10- 5	50- 6	2	1	Fiat	280	....	....	....	....	50- 6	....
Nieuport Macchi.—M-12	PB Boat	S	35- 4	12- 0	56- 0	2	1	Ansaldo	450	....	....	....	....	56- 0	....
Nieuport Macchi.—M-14	TB Land	F	18- 6	8- 3	26- 7	1	1	Le Rhone	110	....	....	....	....	26- 7	....
Nieuport Macchi.—M-15	TB Land	F	28- 2	10-10	44- 3	2	1	Fiat	280	....	....	....	....	44- 3	....
Nieuport Macchi.—M-16	TB Land	SP	13-11	7- 0	19- 8	1	1	Anzani	30	3	3	3- 4	3- 4	19- 8	19- 8
Nieuport Macchi.—M-18	PB Boat	C	32- 0	10- 8	52- 0	3	1	Isotta Fraschini	160	....	....	....	....	52- 0	....
Nieuport Macchi.—M-18	PB Boat	C	32- 0	10- 8	52- 0	4	1	Isotta Fraschini	250	....	....	....	....	52- 0	....
P. R. B.—P. R. B.	2P-2T Boat	C	59- 3	22- 6	105- 6	....	4	Isotta Fraschini	1100	....	....	....	....	105- 6	105- 6
Savoia—S-8	PB Boat	C	29- 7	11- 0	45- 1	2-3	1	Isotta Fraschini	260	....	....	....	....	41-10	45- 1
Savoia—S-9	PB Boat	C	32- 4	11-10	44- 9	2-3	1	Fiat	280	....	....	....	....	44- 9	44- 9
Savoia—S-12	PB Boat	C	37- 8	12- 5	49- 5	4	1	Ansaldo	450	....	....	....	....	49- 5	45- 1
Savoia—S-13	PB Boat	C	29- 6	10- 4	36- 4	2	1	Isotta Fraschini	250	....	....	....	....	36- 4	32- 4
Savoia—S-13	PB Boat	C	27- 5	10- 0	26- 6	1	1	Isotta Fraschini	250	....	....	....	....	26- 6	23-11
Savoia—S-21	PB Boat	R	25- 4	9- 7	25- 2	1	1	Ansaldo	300	....	....	....	....	....	25- 2
Savoia—S-22	IT-IP Boat	C	35- 6	11- 6	44-6	8	2	Isotta Fraschini	520	....	....	....	....	44- 6	44- 6
JAPANESE															
Oguri—A-2	TB Land	Trn	23- 0	....	28- 6	2	1	Hispano-Suiza	180	....	....	4- 7	4- 7	28- 6	28- 6
Itoh—Fuji-I-GO	TB Land	Trn	19-10	8- 3	30- 7	2	1	Clerget	120	3	3	4- 6	4- 6	30- 7	30- 7

ABBREVIATIONS—

*—Estimated
A—Ambulance
At—Attack
B—Bombing
C—Commercial
DB—Day Bombing
E—Experimental
F—Fighting
L—Lower
M—Mail Carrier
Ms—Messenger
N—Naval
P—Pusher
PA—Passenger
PB—Pusher Biplane

**Taken from published data. All other data regarding American planes supplied by manufacturers.

eign Airplanes 1921-1922—Concluded

WING AND TAIL DATA											WEIGHT IN LBS.							PERFORMANCE						
Areas in Square Feet																		High Speed			Climb		Service or	Range at
Wings Total —Ail's	Ailerons	Stabilizer	Elevators	Vert. Fin.	Rudder	Non-skid Planes	Gap Ft.-In.	Stagger In.	Sweep-back deg.	Dihedral deg.	Empty	Gas and Oil	Useful Load	Total Gross	Useful % Gross	Lbs. per H.P.	Lbs. per Sq. Ft.	M.P.H.	Alt. Feet	Low Speed M.P.H.	Mins.	Feet	Approx. Ceiling (Feet)	High Speed (Miles)
....	....	....	....	....	....	None	....	....	None	Tapered	3,600	1,120	2,970	6,570	45.2	14.3	....	126.0	6,500	55	....	....	26,000	500
81	....	....	....	....	....	None	....	....	None	None	....	....	....	1,650	....	5.1	20.6	217.0	.....	.....	.....	.....	.....	.....
2,150	....	....	....	....	....	None	....	None	None	U-0 L-0	9,900	....	5,500	15,400	35.7	14.7	7.2	90.0	SL	.....	....	....	....	....
1,940	....	....	....	....	....	None	....	None	None	....	9,810	2,500	6,060	15,870	38.2	15.9	8.2	101.0	SL	.....	8.0	3,000	....	500
880	....	....	....	....	....	None	9-10	Negative	None	U-2 L-0	4,400	1,650	3,520	7,920	44.4	18.9	9.0	....	....	.....	....	....	....	....
118	10.7	13.8	....	....	....	None	....	....	None	None	....	....	....	1,980	....	6.6	16.8	173.0	SL	.....	....	....	....	....
463	....	....	....	....	....	None	....	....	Upper Only	None	2,200	....	2,200	4,400	50.0	17.5	9.5	110.0	SL	.....	10.1	3,300	....	....
1,300	.....	.....	.....	.....	.....	None.	.....	.....	.....	.....	9,500	.....	6,000	15,500	38.7	14.0	11.9	150.0	SL....	.....	....	....	15,000	....
163	....	....	....	....	....	None	....	....	Tapered	None	....	....	....	2,100	....	7.0	12.9	200.0*	SL	.....	....	....	....	....
217	....	....	....	....	....	None	None	None	Tapered	....	....	....	....	2,100	....	7.0	9.7	198.0*	SL	.....	....	....	....	....
204	....	....	....	....	....	None	5-0	22	None	2.5	660	....	510	1,170	43.5	14.6	5.8	....	....	.....	....	....	....	....
473	....	....	....	....	....	None	....	....	None	U-0 L-2	2,540	730	1,600	4,140	38.7	11.2	8.8	120.0	SL	.....	....	....	....	500
1,010	....	....	....	....	....	None	9-0	None	None	2.5	3,960	1,190	2,840	6,800	41.7	16.2	6.8	100.0	SL	.....	....	....	....	500
355	....	....	....	....	....	None	....	....	None	None	2,260	....	1,020	3,280	31.1	11.9	9.2	130.0	SL	.....	15.0	6,500	....	....
....	....	....	....	....	....	None	....	....	....	....	....	....	990	....	....	....	....	160.0	15,000	.....	....	....	20,000	....
....	....	....	....	....	....	None	....	....	....	....	....	....	5,060	....	....	....	....	124.0	6,000	.....	....	....	16,400	....
287	....	....	....	....	....	None	....	....	None	Tapered	1,800	300	840	2,640	31.7	22.0	9.2	80.0	SL	.....	6.0	3,300	17,000	300
520	....	....	....	....	....	None	....	....	None	None	2,310	330	1,870	4,180	44.7	22.6	8.0	154.0	SL	.....	10.0	4,000	....	225
283	....	....	....	....	....	None	4-10	14	None	U-0 L-0	1,610	225	750	2,360	31.7	14.7	8.4	118.0	SL	.....	....	....	16,400	320
506	....	....	....	....	....	None	....	....	None	None	2,420	360	1,600	4,020	40.5	21.7	7.9	105.0	SL	.....	....	....	16,300	420
310	....	....	....	....	....	....	....	....	....	....	2,580	200	650	3,230	20.0	16.5	10.4	112.0	SL	.....	....	....	....	225
506	....	....	....	....	....	None	....	....	None	None	3,220	300	1,320	4,540	29.1	24.5	9.0	96.0	SL	.....	....	....	13,000	280
193	....	....	....	....	....	None	....	....	None	None	1,520	200	400	1,920	20.8	10.4	10.0	133.0	SL	.....	....	....	....	250
150.5	....	....	....	....	....	None	....	....	None	None	770	....	550	1,320	41.7	22.0	8.8	80.0	SL	.....	....	....	....	....
860	....	....	....	....	....	None	....	....	....	....	5,180	730	2,420	7,600	31.9	21.0	8.8	112.0	SL	.....	....	....	19,500	450
850	....	....	....	....	....	None	....	....	None	None	6,600	770	2,860	9,460	30.2	18.4	11.1	112.0	SL	.....	....	....	14,800	380
1,033	....	....	....	....	....	None	....	....	None	None	6,780	770	3,020	9,800	30.9	18.8	9.5	112.0	SL	.....	....	....	14,800	380
....	....	....	....	....	....	None	....	....	None	....	3,190	600	2,420	5,610	43.0	23.0	....	120.0	SL	60	....	....	....	600
151	....	....	....	....	....	None	....	....	None	None	770	....	550	1,320	41.7	22.0	8.7	80.0	SL	.....	....	....	....	....
484	....	....	....	....	....	None	U M 4-0 M 4-7 L	12	None	U-0 M-2 L-2	....	450	1,543	....	....	....	....	106.0	SL	.....	....	....	....	460
320	....	....	....	....	....	None	....	....	None	3	2,140	360	1,100	3,240	34.0	17.5	10.1	93.0	SL	....	....	....	....	360
....	....	....	....	....	....	None	....	None	None	U-0 L-2.5	....	....	....	2,770	....	23.1	....	80.0	SL	.....	....	....	....	....
....	....	....	....	....	....	None	....	....	Yes	....	....	300	....	4,700	....	21.4	....	100.0	SL	.....	....	....	....	600
....	....	....	....	....	....	None	....	....	....	....	....	320	....	....	....	....	....	85.0	SL	.....	....	....	....	330
....	....	....	....	....	....	None	....	....	None	....	....	300	....	....	....	....	....	100.0	SL	.....	....	....	....	400
1,235	....	....	....	....	....	None	....	....	None	....	6,500	1,600	2,500	9,000	27.8	17.3	7.3	80.0	SL	40	20.0	10,000	....	420
118	....	....	....	....	....	None	....	....	None	None	330	44	176	506	34.4	16.9	4.3	75.0	SL	30	10.0	3,300	....	200
323	....	....	....	....	....	None	....	....	....	....	2,260	300	660	2,920	22.6	11.2	9.1	....	....	.....	10.0	10,000	....	....
....	....	....	....	....	....	None	....	....	None	....	1,400	....	1,200	2,600	46.0	13.0	....	....	....	.....	....	....	....	....
484	....	....	....	....	....	None	....	....	None	None	3,080	400	1,870	4,950	37.8	19.7	10.2	110.0	SL	.....	....	....	....	350
331	21.5	24.0	19.3	5.0	7.4	None	4-9	31	U-2 L-0	U-2 L-0	1,670	....	880	2,550	34.4	13.8	7.7	97.0	SL	.....	....	....	22,000	....
405	....	....	....	....	....	None	....	....	None	U-0 L-2	2,300	....	1,200	3,500	34.3	11.7	8.6	13.0	SL	45	16.0	10,000	....	....
225	....	....	....	....	....	None	....	None	None	U-0 L-2	1,823	300	544	2,367	23.0	5.9	10.5	170.0	SL	61	....	....	....	255
290	....	....	....	....	....	None	....	None	None	U-0 L-2	....	....	1,000	....	....	....	....	145.0	SL	45	30.0	20,000	....	....
7,680	....	....	Ailero Rear	ns on Tripla	ne	None	8-7	None	None	....	32,800	6,000	22,200	55,000	40.4	17.0	7.2	90.0	SL	.....	....	....	....	540
....	....	....	....	....	....	....	8-8	....	....	L-2	7,040	1,650	3,960	11,000	35.9	12.2	....	125.0	SL	50	....	....	15,000	....
775	....	....	....	....	....	....	....	....	....	....	4,950	1,200	2,200	7,150	30.7	10.2	9.2	150.0	SL	.....	11.0	10,000	....	600
....	....	....	....	....	....	None	....	None	None	U-0 L-3	2,680	560	990	3,670	26.9	12.2	....	111.0	SL	.....	6.0	3,300	....	420
280	....	....	....	....	....	None	....	....	....	U-0 L-3	1,710	380	670	2,380	28.1	9.5	8.5	125.0	SL	.....	10.5	10,000	....	500
522	....	....	....	....	....	None	....	....	....	....	2,790	740	1,210	4,000	30.2	14.3	7.8	116.0	SL	.....	10.5	6,500	....	550
657	....	....	....	....	....	None	....	....	....	....	3,930	1,000	1,720	5,650	31.0	12.3	8.5	118.0	SL	.....	....	....	....	600
186	....	....	....	....	....	None	....	....	....	....	900	150	440	1,340	32.8	12.2	7.2	116.0	SL	.....	5.5	6,500	....	250
450	....	....	....	....	....	None	....	....	....	....	2,480	490	1,120	3,600	31.1	12.9	8.0	124.0	SL	.....	10.7	6,500	....	370
122	....	....	....	....	....	None	....	None	None	U-0 L-3.5	350	65	220	570	38.6	19.0	4.7	80.0	SL	.....	9.0	3,300	....	250
484	....	....	....	....	....	None	....	....	....	....	2,250	220	680	2,930	23.2	18.3	6.1	112.0	SL	50	....	....	....	200
484	....	....	....	....	....	None	....	....	....	....	2,450	485	1,100	3,550	31.0	14.2	7.3	105.0	SL	.....	8.0	3,300	....	370
2,300	....	....	....	....	....	None	....	None	None	....	9,900	5,000	7,700	17,600	43.0	16.0	7.7	105.0	SL	55	....	....	....	1,050
495	49.5	21.1	....	....	21.5	....	....	....	....	....	1,980	....	1,030	3,010	34.1	11.6	6.1	89.0	SL	.....	14.0	6,500	....	....
517	40.4	26.7	....	....	19.6	....	....	....	....	....	2,640	480	1,320	3,960	33.4	14.1	7.7	116.0	SL	.....	14.0	6,500	....	450
590	53.2	38.7	....	....	25.8	....	....	....	....	U-0 L-2	3,520	800	1,760	5,280	33.4	11.7	8.9	133.0	SL	.....	8.0	6,500	....	500
354	31.6	24.7	....	....	16.8	....	....	....	....	....	1,920	550	1,030	3,010	34.1	12.0	8.5	129.0	SL	.....	8.5	6,500	..	600
211	23.9	12.9	....	....	14.9	....	....	....	....	....	1,600	250	460	2,060	22.3	8.2	9.8	151.0	SL	.....	....	....	....	300
....	....	....	....	....	....	None	....	....	None	U-0 L-0	1,540	....	440	1,980	22.2	6.6	....	160.0	SL	.....	....	....	16,500	....
....	....	....	....	....	....	None	....	None	None	U-0 L-0	3,500	800	2,000	5,500	36.4	10.6	....	139.0	SL	.....	....	....	20,000	560
323	....	17.2	19.4	2.5	10.7	None	4-7	None	None	1.0	1,670	....	420	2,090	20.0	11.6	6.5	102.0	SL	50	10.0	10,000	....	....
250	24.0	13.5	11.0	....	8.0	None	4-6	None	None	U-0 L-1	1,630	200	550	2,180	25.2	18.2	8.7	95.0	SL	45	3.5	3,300	....	300

PM—Pusher Monoplane
PT—Pusher Triplane
R—Racer
S—Scout or Pursuit
SP—Sport
STP—Scout Torpedo Plane
T—Tractor
Trn—Training
Tap—Tapered
TB—Tractor Biplane
TM—Tractor Monoplane
TT—Tractor Triplane
TP—Torpedo Plane
TF—Trench Fighter
U—Upper

Trend in American Motorcycle Design

THERE is little to be said regarding engineering trends in American motorcycles. A major part of the field is covered by a comparatively small number of makers, while the retardation of motorcycle sales has been so great during the past year that there has been little development in any phase of the business.

A new model was added to the Indian line during the year. It has been christened the "Chief" and in a general way is simply a large sized edition of the "Scout" model. Its engine has the same bore and stroke as has the regular "Standard" Indian model.

There have been minor refinements in the line of practically every maker, but no important changes are to be noted. One new company has entered the field with a two-cycle machine of radical design. This newcomer is called the Neracar. It has been produced in England for some two years, but American production will not begin until the spring of 1922.

While the engineering phases of motorcycle development will always be important, they do not appear to be of paramount interest during the next few years. The development and rejuvenation of the motorcycle industry will depend more upon the ability and vision of those in charge of marketing than upon the efforts of the engineer. It is true, of course, that a capable, sound product and a fair price must be the basis of all successful marketing effort, but the lack of progress in the motorcycle industry during recent years cannot be laid at the door of the engineer. Had the salesmanagers been as successful in marketing their product as were the engineers in designing it and making it capable of service, it is not likely that there would have been a decreased motorcycle registration of more than 27,000 in 1921.

It has been something of a tradition in the American motorcycle industry that the two-cycle type machine is received with particular disfavor in this country, although in England this type machine has enjoyed a popularity equal to that of the four-cycle type. It is interesting to note in the American specification table presented herewith that out of the ten different makes listed, engines of the two-cycle type are used on five different makes, while four-cycle type engines are used on six different makes: one manufacturer makes both two- and four-cycle types.

Viewed from a production standpoint, of course, this ratio would be entirely different, for instead of being 6 to 5 in favor of the four-cycle engine it would be something like 23 to 1.

The table shows the radical reduction in prices which has taken place during 1921. The lowest price on the 1920 specification table was $200, while the lowest on the 1921 table is $140. $600 was the highest price for an electrically equipped model last year at this time, while the present table shows $475 as the top.

A change in frame type is shown by the specifications. Last year 27.7 per cent of the models listed had diamond type frames as against 72.3 per cent with loop type or some variation of the loop type. This year the diamond type predominates on the models listed in the tables, the percentages being: Diamond type, 55.5 per cent; loop type, 33.3 per cent; cradle type, 5.5 per cent; keystone type, 5.5 per cent. This change in per cent is due chiefly to the adoption of the diamond type on the five Iver-Johnson models listed.

The helical spring front forks type has increased from 50 per cent of the total in 1920 to 58 per cent in 1921. The leaf spring front forks type has decreased from 44 per cent in 1920 to 42 per cent in 1921.

American vs. British Practice

A marked difference exists between American and British motorcycle practice, in respect to size, weight, and various design features. There are many reasons for this, some of them being due to difference in road conditions, temperament and customs of users, taxation, fuel cost and competition with the motorcar. There are those who think that there is not sufficient reason for the wide difference in some particulars, that is that the manufacturers, especially in this country, have not interpreted the market correctly, and are therefore not supplying the type of machine which would see the widest sale.

However this may be, it is interesting to note that the average British motorcycle is lighter and less powerful

American Motor

NAME AND MODEL	POWER PLANT								TRANSMISSION					
	Cylinders		Piston Displacement	Cycle Type	Lubrication Type	Carburetor—Make and Size	Ignition—Make	Max. Hp.	Gear Ratio			Change Speed Gear Type	Clutch Type	Final Drive
	Number Bore and Stroke	Arrangement							1st	2nd	3rd			
Cleveland.....1922	1-2¾x2¾	Vert.	16.3	2	O. & G.	Scheb.....	Bosch.	5	6.2	10.3	...	Pos..	O-D	Chain.
Excelsior.....	2-3 1/16x3½	Vee..	61.0	4	Spl.....	Scheb. 1...	Brlng.	17	9.9	6.7	4.1	Prog.	D-D	Chain.
Evans.....G	1-2 x1¾	Vert.	90.0	2	O. & G.	Own.....	Brlng.	....	10.0	...	...	.....	.....	Belt...
Harley-Davidson.....	2-2¾x3	Opp..	35.6	4	Spl.....	Scheb. ¾..	Own..	6	12.9	8.3	5.0	Prog.	O-D.	Chain.
Harley-Davidson.....	2-3 5/16x3½	Vee..	60.3	4	Spl.....	Scheb. 1...	Own..	16	9.7	6.5	4.3	Prog.	D-D	Chain.
Harley-Davidson.....	2-3 7/16x4	Vee..	74.0	4	Spl.....	Scheb. 1¼.	Own..	18	9.7	6.5	4.3	Prog.	D-D	Chain.
Henderson.....	4-2 5/16x3½	Vert.	80.4	4	Force..	Zen. 1.....	Simms	24	7.5*	5.6	3.4	Prog.	O-D	Chain.
Indian.....Scout	2-2¾x3 1/16	Vee..	36.3	4	Sp. F...	Scheb ¾... or Carter..	Split..	11	12.0	7.6	4.8	Prog.	O-D	Chain.
Indian.....Standard	2-3 1/16x3 3/16	Vee..	60.8	4	Sp. F...	Scheb. 1¼. or Carter..	Split..	18	10.5	6.6	4.2	Prog.	D-D	Chain.
Indian.....Chief	2-3 1/16x3 3/16	Vee..	60.8	4	Sp. F...	Scheb. 1¼. or Carter..	Split..	18	11.9	7.5	4.8	Prog.	O-D	Chain.
Iver-Johnson....16-7CTS	2-3¼x3¾	Vee..	31.1	2	Force..	Scheb.....	Bosch.	8	6.5	3.7	...	Hub.	D-D	Chain.
Iver-Johnson.....16-7	2-3¼x3¾	Vee..	31.1	2	Force..	Scheb.....	Bosch.	8	6.5	3.7	...	Hub.	D-D	Chain.
Iver-Johnson....16-4CTS	1-3¼x3¾	Vert.	31.1	4	Force..	Scheb.....	Bosch.	5	6.5	3.7	...	Hub.	.....	Chain.
Iver-Johnson.....16-4C	1-3¼x4½	Vert.	35.2	4	Force..	Scheb.....	Bosch.	5	4.2	...	...	.....	D-D	Chain.
Iver-Johnson.....16-4B	1-3¼x3¾	Vert.	31.1	4	Sp. F...	Scheb.....	Bosch.	4	....	...	...	.....	D-D	Belt...
Neracar.....	1-2½x2¾	Vert.	13.5	2	O. & G.	B. & B.....	Own..	2½	....	...	...	Fric..	.....	Chain.
Reading-Stand..22T-22TE	2-3 5/16x4	Vee..	71.5	4	Spl.....	Scheb. 1¼.	Bosch.	16	3.9	6.0	9.2	Prog.	D-D	Chain.
Schickel.....	1-3 x2½	Vert.	17.6	2	O. & G.	Own.....	Split.. Brlng.	3½	6.0	9.0	...	D-G	O-D	Chain.

*Reverse—5.87
†—Optional

ABBREVIATIONS:
Lubrication Type:
O&G—mix oil with gasoline
Spl—splash
Sp-f—splash and force

Change Speed Gear Type:
D-G—direct gear
Fric—Friction
Hub—2-speed hub
Pos—positive clutch
Prog—progessive sliding
Plan—planatary

Slid—Sliding
Frame Type:
Crad—Cradle
Dia—Diamond
Keys—keystone
L&CS—loop and cradle springs

as Revealed by the 1922 Specifications

than the average American type. The American machines vary in weight from 70 to 460 lb., the average weight being 289 lb., while the average piston displacement is 46.5 cu. in. British machines vary in weight from 90 to 350 lb., the average being 223 lb., while the average displacement is only 29.1 cu. in., or about five-eighths as great as the American. The average British machine, however, sells for about $400 at current exchange rates, while the average American machine sells for $291, in spite of its greater weight and higher power. These figures are of course based on the average figures for the models listed in each case and would be considerably different if based on total production.

It is interesting to note that the average American machine sells for about $1 per lb., while the British machines average about $1.80 per lb.

Final Drive

In respect to design it will be noted that nearly half of the British motorcycles have a final drive by belt, nearly all of these having a first reduction by chain. The balance are all-chain drive. Of the American machines listed, only two, or about 11 per cent, have belt drive, one reason being that the American machine is as a rule too heavy and too powerful to use a belt of convenient proportions satisfactorily. The belt drive has certain marked advantages, as well as some disadvantages, but is not well suited for use on heavy and powerful machines.

Despite the bad year through which the motorcycle industry, in common with others, has just passed, there were numerous encouraging signs. The realization on the part of manufacturers that there are ways to sell motorcycles other than that of spending money to support racing is one of the most important. One manufacturer has ceased to support a racing team, while another is conducting a really scientific market analysis upon which to base production and sales plans.

The last meeting of the Motorcycle and Allied Trades Association in New York brought forth discussion among the manufacturers of many problems vital to the industry and the serious phases of the situation were discussed in a constructive way. There is an old saying to the effect that the presence of one swallow doesn't necessarily mean that spring has arrived, but in the present instance the simile might be turned around by saying that the coming of the swallow at least indicates that winter is going.

Present indications are that 1922 will witness some interesting events in the motorcycle industry, at least from a commercial angle. A definite effort will be made by one company to market a radical type motorcycle strictly along utility and personal convenience lines. One of the established manufacturers is seriously going into market analysis. Another has refused to support racing teams. Another is radically readjusting his dealer organization. Things are being done, and 1922 is likely to see some results accomplished.

cycle Specifications

FRAME AND WHEELS						MISCELLANEOUS								
Wheelbase	Frame Type	Front Forks Type	Tires—Size (In.)	Road Clearance Exclusive of Pedals	Height of Saddle Above Ground	Starting System	Lighting System	Brakes—No. and Type	Gas. Tank Capacity (Gals.)	Oil Tank Capacity (Qts.)	Weight Empty (Lbs.)	Speed—Normal in M.P.H.	Price	Price—Electrically Equipped
56¼	Dia.	Hel.	26x3	6	29½	K.	Split.	1 Ext.	2¼	...	180	35	$185	$220
59	Dia.	Hel.	27x3½	5½	30	K.	Split.	1 Ext. 1 Int.	3	3	385	70	....	365
49	Loop.	.....	.....	7	....	P.	Brlng.	Coast Hub	1¼	...	70	28	...	140
53½	Dia.	Hel.	26x3	...	28	K.	Own Gen. Exi. Bat.	1 Ext. 1 Int.	2½	2	260 280	..	310	340
60	Loop.	Hel.	28x3	...	30½	K.	Own Gen. Exi. Bat.	1 Int. 1 Ext.	3⅛	4¾	345 365	65	335	365
60	Loop.	Hel.	28x3	...	30½	K.	Own Gen. Exi. Bat.	1 Int. 1 Ext.	3⅛	4¾	350 370	70	360	390
60	Crad.	Hel.	27x3½	4¼	29	K.	Split.	1 Ext. 1 Int.	3	3	416	72	...	475
54	Loop.	Leaf.	26x3	5	28	K.	Split.	1 Ext.	2¾	3	300 327	..	...	345
59½	L.&C.S.	Leaf.	28x3	5½	32	K.	Split.	1 Ext. 1 Int.	3¼	3	378½	..	...	370
60⅜	Loop.	Leaf.	28x3	5	30	K.	Split.	1 Ext. 1 Int.	3⅜	3⅛	410	..	...	435
56	Dia.	Leaf.	28x3	6	32	K.	Prest.	1 Ext.	2	1½	260	..	250	...
56	Dia.	Leaf.	28x3	6	32	K.	Prest.	1 Ext.	2	1½	260	..	225	...
56	Dia.	Leaf.	28x3	6	32	K.	Prest.	1 Ext.	2	1½	220	..	200	...
56	Dia.	Leaf.	28x3	6	32	K.	Prest.	1 Ext.	2	1½	220	..	175	...
56	Dia.	Leaf.	28x3	6	32	K.	Prest.	1 Ext.	2	1½	215	..	150	...
55½	Own.	Own.	26x3	8½	....	K.	Own.	1 Int.	2	...	165	..	...	225
58	Dia.	Hel.	28x3	5	30	K.	Split.	1 Ext. 1 Int.	3	3½	343 366	65	345	375
53	Keys.	Hel.	26x2¼	5½	29	K.	Brlng.	1 Ext.	1½	...	160	30	185	195

Front Forks Type:
Hel—helical spring
Leaf—leaf spring
Starting System:
K—kick
P—pedal
H—hand crank
Clutch Type:
O-D—oil disk
Motorcycles:
D-D—dry disk
Ignition make:
Eisem—Eisemann
Carburetor make:
Zen—Zenith
Scheb—Schebler
B&B—Ball & Ball

There has been some tendency recently on the part of the motorcycle manufacturers to break away from the bicycle trades and to carry on their exhibits and marketing policies alone to a greater or less extent. This tendency was exemplified by the decision of the motorcycle manufacturers a month or so ago not to participate in the annual mid-summer meeting of the Cycle Trades of America at Atlantic City. It has been felt for some time that this summer meeting did not accomplish anything very constructive from a business standpoint and that the motorcycle manufacturers could cash in on their time better by holding a separate motorcycle meeting at a time and place more favorable for their particular purposes.

All these movements are in line with the general realization of the fundamental problems of the industry which seems to be taking place throughout the various motorcycle companies. A serious situation confronts the motorcycle industry from a marketing standpoint and the necessity for a careful analysis of all the factors involved has become evident.

As might be expected this realization has not yet spread through the dealer organizations; it is really still in the process of being born among manufacturers. It will be necessary, however, for the manufacturers to build up dealer organizations capable of carrying out constructive marketing plans.

British Motorcycle

(Compiled for Automotive

MAKE	ENGINE								TRANSMISSION							MISCELLANEOUS						
									GEAR RATIO								BRAKES					
	No. Cylinders Bore and Stroke m. m.	Piston Displacement cu. cm.	Cylinder Arrangement	Valve Location	Cycle Type	Lubrication Type	H. P.	Engine Make	1	2	3	Clutch Type	Final Drive	Gearset Make	Frame Type	Tire Size In.	Lighting System Make	Front	Rear	Fuel Tank Capacity Gal.	Weight Lbs.	Price (£)	New Model
A. J. S.	1-74x81	348.0	L	L	4	Spl.	2¾	Own	12	7½	5	Plate	Chain	Own	R	26x2¼		Int.	Int.	1.75	210	85	No.
A. J. S.	2-74x93	799.8	V	L	4	Spl.	7	Own	16	9	5	Plate	Chain	Own	R	28x3	Lucas	Int.	Int.	2.25	336	135	No.
Allen	1-70x76	292.4			2	Spl.	2¾	Own	9		5¾	Plate	Ch & b	Own	R	26x2¼		Ext.	Ext.		180	60	No.
Ariel	1-86x85	493.7		L	4	Spl.	3½	Own	16	9	5	Plate	Ch & b	Own	R	26x2½	Lucas	Rim	V rim	2.12	280	95	No.
Ariel	1-92x100	664.7		L	4	Spl.	4½	Own	16	9	5	Plate	Chain	Own	R	28x3	Lucas	Int.	Int.	2.62	318	105	No.
Ariel	2-73x95	795.2	V	L	4	H-S	6	Own	14	7¾	4½	Plate	Ch & b	Own	R	26x2½	Lucas	Rim	V rim	2.12	300	110	No.
Ariel	2-82x94	992.8	V	O'In.	4	Spl.	8	M. A. G.	14	7¾	4⅝	Plate	Chain	Own	R	28x3	Lucas	Int.	Int.	2.62	335	125	Yes.
Armis	1-70x76	292.4		L	4	Spl.	2¾	J. A. P.	9½		5	Plate	Ch & b	Burman	R	26x2¼		Rim	V rim	1.5	170		No.
Armis	1-74x81	348.0			2	Spl.	3½	Precision	9½		5	Plate	Ch & b	Burman	R	26x2¼		Rim	V rim	1.5	180		No.
Armis	2-70x85	654.2	V	L	4	Spl.	5	J. A. P.				Plate	Ch & b	Burman	R	26x2½		Rim	V rim	1.5	220		No.
Bat	2-76x85	671.2	V	L	4	Spl.	6	J. A. P.	11	8	4½	Multi-d	Chain	St. Arch.	S	28x3		None	Int & ext.	2.0	300	85	No.
Beardmore Precision	1-70x90	346.4		Sleeve	4		3½	Barr& Strd	8		4¼	Plate	Ch & b	St. Arch.	R	26x2¼		Ext.	V rim	2.0	198		Yes.
Beardmore Precision	1-74x81	348.0			2	Spl.	3½	Own	9		5	Expand	Chain	Own	S	26x2¼	Bt. H.	Ext.	Int.	2.0	230	75	No.
Beardmore Precision	1-89x96	597.2		L	4		4½	Own	15	9	5½	Multi-d	Chain	St. Arch.	S	28x3	Bt. H.	Ext.	Int.	2.0	300	105	Yes.
Bradbury	1-74x80	344.0		L	4	Spl.	2¾	Own	10		5	Plate	Ch & b	Own	R	26x2⅜		Rim	V rim	1.5	240	80	No.
Bradbury	1-89x89	553.7		L	4	Spl.	4	Own	15	8½	5	Plate	Chain	Own	R	26x2½		Rim	Int.	1.5	280	92	No.
Bradbury	2-74x86	739.8	V	L	4	Spl.	6	Own	15	8½	5	Plate	Chain	Own	R	26x2½		Rim	Int.	2.25	325	117	No.
Bradbury	2-80x99	995.2	V	L	4	Spl.	8	Own	12	8	4½	Plate	Chain	Own	R	28x3		Rim	Int.	2.25	340	135	Yes.
Brough	2-70x64	493.0	Opp.	L	4	Spl.	3½	Own	8¼	5¼	4¼	Multi-d	Chain	St. Arch.	R	26x2⅜		Int.	V rim	1.75	196		No.
Brough	2-70x90	692.6	Opp.	L	4	Spl.	5	Own	12	7½	4½	Multi-d	Chain	St. Arch.	R	26x2½		Int.	V rim	2.25	255		No.
B. S. A.	1-85x95	539.1		L	4	Spl.	4¼	Own	13	8	5	Plate	Chain	Own	R	26x2½		V rim	V rim	1.75	263	110	Yes.
B. S. A.	1-85x95	539.1		L	4	Spl.	4¼	Own	13	8	5	Plate	Ch & b	Own	R	26x2½		V rim	V rim	1.75	256	107	No.
B. S. A.	2-76x95	862.0	V	L	4	Spl.	6	Own	13	8	5	Plate	Chain	Own	R	26x3		V rim	V rim	1.75	328	132	Yes.
B. S. A.	2-80x98	985.2	V	L	4	Spl.	8	Own	13	8	5	Plate	Chain	Own	R	28x3		V rim	Int.	2.12	350	145	Yes.
Calthorpe	1-67x69	243.4			2	Spl.	2½	Peco		9	5½	Plate	Ch & b	St. Arch.	R	24x2		Rim	V rim	1.25	160	36	Yes.
Calthorpe	2-64x76	489.0	V	L	4	Spl.	4	J. A. P.	15	8	5	Plate	Ch & b	Burman	R	26x2¼		Rim	V rim	1.75	212		Yes.
Campion	2-85x85	964.7	V	L	4	Spl.	8	J. A. P.	12	8	4¾	Multi-d	Chain	St. Arch.	R	28x3		Int.	Int.	2.5	335	140	Yes.
Cedos	1-62x70	211.3			2	Spl.	2¼	Own				None	Ch & b	Own	R	24x2¼	B. T. H.	V rim	V rim	1.75	140		No.
Cedos	1-67x70	246.9			2	Spl.	2½	Own				None	Ch & b	Own	R	26x2¼	B. T. H.	V rim	V rim	1.75	150		No.
Connaught	1-73x70	293.0			2	Pet	2¾	Own		9⅝	5¼	Plate	Ch & b	St. Arch.	R	26x2¼		V rim	V rim	1.5	165	57	No.
Connaught	1-				2	Spl.	3½	Own	16	9	5	Plate	Chain	Burman	R	26x2½			Int. & ext.	2.0		75	Yes.
Cotton	1-70x70	269.4			2	Spl.	2½	Villiers		9	5	Plate	Ch & b	St. Arch.	R	26x2¼	Villiers	Rim	V rim	1.75	160	52	No.
Cotton	1-71x88	348.4		L	4	Spl.	2¾	Blackb'r'e		9	5	Plate	Ch & b	St. Arch.	R	26x2¼	B. T. H	Rim	V rim	1.75	173	65	Yes.
Coulsen	1-70x70	269.4			2	Spl.	2½	Liberty				Plate	Ch & b		S	26x2¼			2 Int.	1.25	180	67	Yes.
Coulsen	1-71x88	348.4		L	4	Spl.	2¾	Blackb'r'e				Plate	Ch & b	Burman	S	26x2½			2 Int.	1.25	191	78	No.
Coulsen	1-85x88	499.3		L	4	Spl.	4¼	Blackb'r'e				Plate	Ch & b	Burman	S	26x2½			2 Int.	1.5	240		No.
Diamond	1-70x70	269.4			2	Spl.	2½	Villiers		11	6	Plate	Ch & b	St. Arch.	R	26x2¼		Rim	V rim	2.0	167	42	No.
Diamond	1-70x76	292.4		L	4	Spl.	2¾	J. A. P.		11	6	Plate	Ch & n	St. Arch.	R	26x2¼		Rim	V rim	2.0	168	58	No.
Dot	1-70x90	346.4		L	4	Spl.	2¾	J. A. P.	9	7	5	Plate	Chain	Albion	R	26x2⅜		Int.	Int.	1.75	175	90	Yes.
Dot	2-85x85	964.7	V	L	4	Spl.	8	J. A. P.	7¾	5	3½	Multi-d	Chain	St. Arch.	R	28x3		Ext.	Int.	2.25	260	150	Yes.
Douglas	2-61x60	350.6	Opp.	L	4	Spl.	2¾	Own		8½	6	Plate	Ch & b	Own	R	26x2¼		Rim	V rim	1.25	175	75	No.
Douglas	2-68x68	493.8	Opp.	I	4	Spl.	3½	Own				Plate	Chain	Own	R	26x2½		Shoe	Int.	1.5	260	130	Yes.
Douglas	2-74x68	585.0	Opp.	L	4	Spl.	4	Own	12	8	5	Plate	Ch & b	Own	R	26x2⅜		Rim	V rim	2.0	250	135	No.
Douglas	2-83x68	737.0	Opp.	H	4	Spl.	6	Own	12	7	4½	Plate	Chain	Own	R	26x3		Shoe	Int.	2.0	320		Yes.
Dunelt	1-85x88	499.3			2	Spl.	4	Own	12	7	4½	Multi-d	Ch & b	St. Arch.	R	28x3		V rim	V rim	2.25	270	85	No.
Duxme	1-89x79	492.0		H	4	Spl.	3½	Own					Belt		R	26x2½			2Vrim	1.75	215	80	No.
Duxme	1-89x79	492.0		H	4	Spl.	3½	Own	12	7	5	Multi-d	Chain	St. Arch.	R	26x2½		Int.	V rim	1.75	245	115	Yes.
Eagle	1-70x64	246.5		H	4	Spl.	2¼			11	6	Plate	Chain	St. Arch.	R	26x2⅜		Int.	V rim	2.0	165	105	Yes.
Eagle	1-70x70	269.4			2	Spl.	2½	Villiers		11	6	Plate	Ch & b	St. Arch.	R	26x2¼	Villiers	Rim	V rim	1.5	190	56	Yes.
Eagle	1-70x76	292.4		L	4	Spl.	2¾	J. A. P.		11	6	Plate	Ch & b	St. Arch.	R	26x2¼		Rim	V rim	2.0	210	70	Yes.
Eagle	1-70x90	346.4		L	4	Spl.	3	J. A. P.		11	6	Plate	Chain	St. Arch.	R	26x2¾		Int.	V rim	2.0	230	88	Yes.
Eagle	1-85x85	482.3		L	4	Spl.	3½	J. A. P.	14	8½	5¼	Multi-d	Chain	St. Arch.	R	26x2½		V rim	V rim	2.5	240	110	Yes.
Eagle	1-85x95	539.1		L	4	Spl.	4¼	J. A. P.	14	8½	5¼	Multi-d	Chain	St. Arch.	R	26x2½		V rim	V rim	2.5	250	110	Yes.
Eagle	2-70x88	677.2	V	L	4	Spl.	6	J. A. P.	14	8½	5¼	Multi-d	Chain	St. Arch.	R	26x2½		V rim	V rim	2.5	290	125	Yes.
Economic	2-52x34	144.5	Opp.		2	Pet	2	Own		14	9		Ch & b	Own	R	26x2¼	Flywheel	Rim	V rim	1.5	94	34	Yes.
Enfield	1-64x70	225.2			2	Pet	2¾	Own		9	5	Exp. Ring	Chain	Own	R	24x2¼		Rim	V rim	1.62	147	55	No.
En eld	2-85x85	964.7	V	L	4	Spl.	8	Vickers		8¼	4½	Exp. Ring	Chain	Own	R	28x3		V rim	V rim	2.0	280		No.
Excelsior	1-70x70	269.4			2	Spl.	2½	Villiers			5½		Belt		R	26x2¼	Villiers	Rim	V rim	1.12	137	40	Yes.
Excelsior	1-71x88	348.4		L	4	Spl.	2¾	Blackb'r'e	15	9	5	Plate	Chain	Burman	R	26x2¼		Rim	Ext.	1.12	197	82	Yes.
Excelsior	1-86x112	650.6		L	4	Spl.	4½	Own	15	9	5	Plate	Chain	Burman	R	28x3		Rim	V rim	2.0	294	95	No.
Excelsior	2-76x85	671.2	V	L	4	Spl.	6	J. A. P.	15	9	5	Plate	Chain	Burman	R	28x3	Lucas	Rim	Ext.	2.0	298	105	No.
Francis Barnett	1-70x70	269.4			2	Spl.	2½	Villiers		*11	6	Plate	Ch & b	St. Arch,	R	26x2¼	Villiers	Rim	V rim	1.5	150	62	Yes.
Francis Barnett	1-70x76	292.4		L	4	Spl.	2¾	J. A. P.		10	6	Plate	Ch & b	St. Arch.	R	26x2¼	M. L.	Rim	V rim	1.75	188	73	No.
Haw er	1-69x76	284.1			2	H. S.	2¾	Own				None	Ch & b	Own	R	26x2¼			2Vrim	2.0	160	52	No.
Hawker	1-71x88	348.4		L	4	Spl.	2¾	Blackb'r'e	15	10	5½	Plate	Chain	Burman	R	26x2¼		Int.	Int.	2.0	190	84	Yes.
Hawker	1-71x88	348.4		H	4	Spl.	2¾	Blackb'r'e	Var.	Var.	Var.	Plate	Chain	Burman	R	26x2¼		Int.	Int.	2.0	200	100	Yes.
Hawker	1-85x97	550.4		L	4	Spl.	4¼	Blackb'r'e	16	10	5	Plate	Chain	Burman	R	26x2¼		Int.	Int.	2.0	200	90	Yes.
Hazlewood	1-70x76	292.4		L	4	Spl.	2¾	J. A. P.		10	6	Plate	Ch & b	St. Arch.	R	26x2¼		Rim	V rim	1.5	160	67	Yes.
Hazlewood	1-85x85	482.3		L	4	Spl.	4	J. A. P.	10		6	Plate	Ch & b	Own	R	26x2½		V rim	V rim	1.75	280	98	Yes.
Hazlewood	2-70x76	292.4	V	L	4	Spl.	6	J. A. P.	13½	8	4½	Plate	Ch & b	Own	R	26x2½		V rim	V rim	1.75	300		Yes.
Hazlewood	2-85x85	964.7	V	L	4	Spl.	8	J. A. P.	12½	7	4¼	Plate	Chain	Own	R	28x3		V rim	Int.	2.5	330		No.
Hobart	1-67x70	246.9			2	Spl.	2½	Morris		10	5¾	Plate	Ch & b	St. Arch.	Opt.	26x2¼	B. T. H.	Rim	V rim	1.5	165	55	Yes.
Hobart	1-70x76	292.4		L	4	Spl.	2¾	J. A. P.		10	5¾	Plate	Ch & b	St. Arch.	Opt.	26x2¼	B. T. H	Rim	V rim	1.75	180	68	No.
Hobart	1-70x90	346.4		L	4	Spl.	2¾	J. A. P.	15	9¼	5¾	Multi-d	Chain	St. Arch.	Opt.	26x2¼	B. T. H.	V rim	V rim	1.75	190	90	Yes.
Hudson	1-62x70	211.3			2	Spl.	2¼	Own		10	5¾	Plate	Ch & b	Own	R	26x2		Rim	V rim	1.5		63	No.
Hudson	1-87x100	594.5		H	4	Spl.	4½	Own	12	8	4½	Plate	Chain	St. Arch.	R	28x3		Int.	Int.	2.5		100	Yes.
Humber	2-75x68	600.0	Opp.	L	4	Spl.	4½	Own	14	8½	5	Multi-d	Chain	Own	R	26x2½		Rim	V rim	2.25	275	105	No.

ABBREVIATIONS

Cylinder Arrangement:
*Inclined side by side, water cooled.
Opp—Horizontally opposed.

Location:
L—Valves in side pockets.
O'In—Overhead inlet, side exhaust.
O'Ex—Overhead exhaust, side inlet.
H—Both valves in the head.

Lubrication:
H-S—Oil forced to journals and crankpin through drilled crankshaft.
HSD—Drilled crankshaft, drip feed to one journal bearing, thence by centrifugal force to crankpin.
spl—Splash; crankcase supplied by hand pump, drip, semi-automatic or automatic feed, or oil supply carried on crankcase pump.
Pet—Lubricating oil mixed with fuel.

Clutch Type:
plate—Single dry plate, fabric faced or cork inserts.
multi-d—Multiple dry disk, fabric faced.
exp-ring—Expanding ring.

Final Drive:
ch—All chain.
ch & b—Primary drive by chain; final by V belt.
b—Belt.

Brakes:
rim—Horseshoe type applying to tire rim.
int—Expanding shoes in hub drum.
ext—Contracting band on hub drum.
shoe—Single exterior shoe applying to large diameter drum.
V-rim—Shoe applying to special or V belt rim.

Frame Type:
R—Rigid.
S—Spring.

Specifications—1922

Industries by M. W. Bourdon)

MAKE	ENGINE								TRANSMISSION						MISCELLANEOUS						
									GEAR RATIO							BRAKES					
	No. Cylinders Bore and Stroke m. m.	Piston Displacement cu. cm.	Cylinder Arrangement	Valve Location	Cycle Type	Lubrication Type	H. P.	Engine Make	1	2	3	Clutch Type	Final Drive	Gearset Make	Frame Type	Tire Size In.	Lighting System Make	Front	Rear	Fuel Tank Capacity Gal.	Weight Lbs.	Price (£)	New Model
Imperial	1-70x76	292.4	.....	L	4	Spl...	2¾	Own.....	16	9	5¾	Plate...	Chain.	Own....	R	26x2¼	M. L...	Int...	Int...	1.75	180	73	Yes..
Imperial	1-85x85	482.3	.....	L	4	Spl...	4	J. A. P....	13½	8½	4½	Plate...	Chain.	Own....	R	26x2½	M. L...	Rim..	Int...	1.75	190	95	Yes..
Imperial	2-85x85	964.7	V	L	4	Spl...	8	Own.....	13½	8½	4½	Plate...	Chain.	Own....	R	28x3	Lucas...	Rim..	V rim.	2.0	.....	118	No...
James	1-66x70	239.5	.....	.....	2	Spl...	2¼	Own.....	.....	10½	5½	None...	Ch & b	Own....	R	26x2¼	.....	Int...	V rim.	1.5	150	60	No...
James	2-64x77	485.2	V	L	4	Spl...	3½	Own.....	10	7	5	Multi-d	Chain.	Own....	R	26x2¼	.....	Int...	Int...	2.0	230	105	No...
James	1-86x103	597.7	.....	L	4	Spl...	4¼	Own.....	14	8	5	Multi-d	Chain.	Own....	R	28x3	.....	Rim..	Int...	2.0	296	105	No...
James	2-76x89	807.4	V	L	4	Spl...	7	Own.....	14	8	5	Multi-d	Chain.	Own....	R	28x3	.....	Int...	Int...	2.0	325	125	No...
J. E. S.	1-60x60	169.6	.....	H	4	Spl...	1½	Own.....	.....	12½	7	None...	Belt...	Own....	R	24x2	.....	Rim..	V rim.	1.0	90	49	Yes..
Lea Francis	2-64x77	247.7	V	O'In	4	Spl...	3½	M. A. G...	12	7½	5	Plate...	Chain.	Own....	R	26x2¾	.....	V rim.	V rim.	2.0	210	110	No...
Lea Francis	2-64x92	295.9	V	O'In	4	Spl...	5	M. A. G...	13½	7½	5	Plate...	Chain.	Own....	R	26x3	Lucas...	V rim.	V rim.	2.0	275	125	Yes..
Levis	1-62x70	211.3	.....	.....	2	H.S.D	2¼	Own.....	.....	.....	5¾	None...	Belt...	.....	R	24x2¼	.....	Rim..	V rim.	1.25	110	48	No...
Levis	1-67x70	246.9	.....	.....	2	H.S.D	2½	Own.....	.....	9	5	Plate...	Ch & b	St. Arch.	R	24x2¼	.....	Rim..	V rim.	1.5	140	66	Yes..
L. M. C.	1-85x88	499.3	.....	L	4	Spl...	3½	Own.....	Op.	Op.	Op.	Multi-d	Ch & b	St. Arch.	R	26x2½	.....	.....	2Vrim.	2.0	210	85	No...
L. M. C.	2-79x85	416.6	V	L	4	Spl...	6	Own.....	Op.	Op.	Op.	Multi-d	Chain.	St. Arch.	R	26x2½	.....	.....	Int. & Ext.	2.0	250	115	No...
L. M. C.	2-79x98	480.4	V	L	4	Spl...	8	Own.....	Op.	Op.	Op.	Multi-d	Chain.	St. Arch.	R	28x3	.....	.....	Int. & Ext.	3.0	280	125	Yes..
Martinsyde	2-70x88	677.2	V	O'Ex	4	Spl...	6	Own.....	17	11	5¼	Plate...	Chain.	Own....	R	26x3	Lucas...	V rim.	V rim.	2.5	250	.....	Yes..
Matchless	2-82x94	992.8	V	O'In	4	Spl...	8	M. A. G...	13	7¾	4½	Plate...	Chain.	Own....	S	28x3	Lucas...	Rim..	Int...	2.5	320	130	No...
Metro Tyler	1-70x70	269.4	.....	.....	2	Spl...	2½	Own.....	.....	10	5½	Plate...	Ch & b	Albion...	R	26x2½	B. T. H.	Rim..	V rim.	1.25	165	60	No...
Metro Tyler	1-70x70	269.4	.....	.....	2	Spl...	2½	Own.....	.....	11	6	None...	Ch & b	Own....	R	26x2¼	B. T. H.	Rim..	V rim.	1.50	180	70	No...
Metro Tyler	2-71x88	696.8	V	L	4	Spl...	6	Own.....	10½	6½	4	Multi-d	Chain.	St. Arch.	R	26x2½	B. T. H.	Int...	Int...	2.25	260	125	Yes..
Norton	1-79x120	588.2	.....	L	4	Spl...	3½	Own.....	.....	.....	3½	None...	Belt...	.....	R	26x2¼	Lucas...	Rim..	V rim.	2.0	203	80	No...
Norton	1-79x120	588.2	.....	L	4	Spl...	3½	Own.....	.....	.....	4	Multi-d	Chain.	St. Arch.	R	26x2¼	Lucas...	Rim..	V rim.	2.0	241	115	No...
Norton	1-82x120	633.7	.....	L	4	Spl...	4	Own.....	.....	.....	4	Multi-d	Chain.	St. Arch.	R	26x3	Lucas...	Rim..	V rim.	2.25	287	120	No...
N. U. T.	2-64x76	489.0	V	L	4	Spl...	3½	Own.....	12	7¼	4½	Multi-d	Chain.	St. Arch.	R	26x2½	Lucas...	Rim..	Int...	2.0	175	110	Yes..
N. U. T.	2-70x88	677.2	V	L	4	Spl...	5	Own.....	12	7¼	4½	Multi-d	Chain.	St. Arch.	R	26x2½	Lucas...	Rim..	Int...	2.0	295	120	Yes..
O. K.	1-70x76	292.4	.....	.....	2	Spl...	2½	Own.....	.....	.....	.....	Plate...	Chain.	Albion..	R	26x2½	.....	Int...	V rim.	1.12	188	55	Yes..
Olympic	1-70x76	292.4	.....	L	4	Spl...	2¾	J. A. P....	.....	.....	5¾	Plate...	Ch & b	Burman.	R	26x2½	.....	Rim..	V rim.	1.75	185	70	Yes..
Peters	1-76x76	344.7	.....	.....	2	Spl...	3½	Own.....	11	.....	3¾	None...	Belt...	.....	S	26x2½	Runb...	.....	2Vrim.	2.75	145	66	Yes..
P. & M.	1-84x100	554.2	.....	L	4	Spl...	4½	Own.....	12 & 18	8	5¼	Exp. Ring..	Chain.	Own....	R	26x2½	.....	V rim.	Ext...	2.0	280	115	Yes..
Quadrant	1-87x110	653.9	.....	L	4	Spl...	4½	Own.....	13	8	5	Plate...	Ch & b	St. Arch.	R	26x2½	.....	Rim..	V rim.	2.25	280	80	Yes..
Radco	1-67x70	246.9	.....	.....	2	Spl...	2½	Own.....	.....	.....	.....	Plate...	Ch & b	Burman.	R	24x2¼	M. L...	Rim..	V rim.	1.37	130	42	No...
Raleigh	1-71x88	348.4	.....	L	4	Spl...	2¾	Own.....	10½	.....	5¼	Plate...	Ch & b	St. Arch.	R	26x2¼	.....	V rim.	V rim.	1.75	190	68	Yes..
Raleigh	1-76x88	399.2	.....	L	4	Spl...	3	Own.....	12	7¼	4½	Multi-d	Ch & b	St. Arch.	R	26x2¼	.....	V rim.	V rim.	1.75	210	78	Yes..
Raleigh	2-87x85	1010.6	Opp.	L	4	Spl...	6	Own.....	11	7	4	Multi-d	Ch & b	St. Arch.	S	26x2¾	.....	V rim.	Int...	2.5	295	130	No...
Rover	1-85x88	499.3	.....	L	4	Spl...	4	Own.....	16½	9	5½	Multi-d	Chain.	Own....	R	26x2½	.....	V rim.	Int...	2.0	280	100	No...
Rover	1-85x88	499.3	.....	L	4	Spl...	4	Own.....	14	7½	4½	Multi-d	Chain.	Own....	R	26x2½	.....	V rim.	Int...	2.0	250	110	Yes..
Rover	2-70x85	654.2	V	L	4	Spl...	5	J. A. P....	16½	9	5½	Multi-d	Chain.	Own....	R	28x3	.....	V rim.	Int...	2.0	300	120	No...
Ruby	1-74x80	344.0	.....	L	4	Spl...	2¾	Own.....	10	.....	6	Plate...	Ch & b	Own....	R	26x2¼	.....	V rim.	V rim.	1.5	180	70	No...
Ruby	1-74x86	369.9	.....	L	4	Spl...	3	Own.....	12	9	6	Plate...	Ch & b	Own....	S	26x2½	.....	V rim.	V rim.	1.75	240	90	No...
Ruby	2-85x85	964.7	V	L	4	Spl...	8	J. A. P....	14	8½	5¼	Multi-d	Chain.	St. Arch.	S	28x3	Lucas...	V rim.	Int...	2.0	280	.....	No...
Rudge	1-85x88	499.3	.....	O'In.	4	Spl...	3½	Own.....	7	.....	3½	Multi-d	Belt...	Exp. pul.	R	26x2½	.....	Rim..	V rim.	2.75	240	85	No...
Rudge	1-85x88	499.3	.....	O'In.	4	Spl...	3½	Own.....	11½	8½	4½	Plate...	Chain.	Own....	R	26x2½	M. L...	Shoe..	Shoe..	2.75	270	100	Yes..
Rudge	2-85x88	998.6	V	O'In.	4	Spl...	8	Own.....	10	7	4	Plate...	Chain.	Own....	R	28x3	M. L...	Shoe..	Shoe..	2.75	295	120	Yes..
Scale	1-71x88	348.4	.....	H	4	Spl...	2¾	Black'br'e.	11½	7	5	Plate...	Chain.	Burman.	R	26x2¼	.....	V rim.	V rim.	1.5	175	95	Yes..
Scale	1-85x95	539.1	.....	L	4	Spl...	4¼	Blackb'r'e.	12	7¼	5½	Multi-d	Chain.	St. Arch.	R	26x2½	.....	V rim.	V rim.	1.75	210	100	No...
Scott	2-70x63	485.0	*	.....	2	Spl...	3½	Own.....	5½	.....	3¾	Exp. Ring..,	Chain.	Own....	R	26x2½	.....	Rim..	Shoe..	1.75	194	105	Yes..
Scott	2-73x63	527.0	*	.....	2	Spl...	3¼	Own.....	8	.....	4¼	Exp. Ring..	Chain.	Own....	R	26x2½	Lucas...	Rim..	Shoe..	2.0	230	110	No.
Sirrah	1-64x76	244.5	.....	L	4	Spl...	2¼	J. A. P....	.....	.....	.....	Plate...	Chain.	Burman.	R	24x2	.....	Rim..	V rim.	1.5	170	84	Yes..
Sirrah	1-70x76	292.4	.....	.....	2	Spl...	2¾	Own.....	.....	.....	.....	None...	Belt...	None....	R	26x2¼	.....	Rim..	V rim.	1.5	160	38	Yes..
Sirrah	1-70x76	292.4	.....	L	4	Spl...	2¾	J. A. P....	.....	.....	.....	Plate...	Ch & b	Burman.	R	26x2¼	.....	Rim..	V rim.	1.5	190	55	No...
Sirrah	1-71x88	348.4	.....	L	4	Spl...	2¾	Blackb'r'e.	.....	.....	.....	Plate...	Ch & b	Burman.	R	26x2¼	.....	Rim..	V rim.	1.5	220	67	No...
Sirrah	1-70x90	346.4	.....	L	4	Spl...	2¾	J. A. P....	.....	.....	.....	Plate...	Ch & b	Burman.	R	26x2¼	.....	Rim..	V rim.	1.5	210	73	Yes..
Sirrah	2-70x88	677.2	V	L	4	Spl...	5	J. A. P....	.....	.....	.....	Multi-d	Ch & b	St. Arch.	R	26x3	.....	Rim..	V rim.	1.75	280	125	Yes..
Spark	1-70x70	269.4	.....	.....	2	Spl...	2½	Villiers....	.....	.....	6	None...	Belt...	None....	R	26x2¼	Villiers.	.....	2Vrim.	1.75	140	40	Yes..
Sparkbrook	1-70x70	269.4	.....	.....	2	Spl...	2½	Villiers....	9	.....	5½	Plate...	Ch & b	St. Arch.	R	26x2¼	Villiers.	Rim..	V rim.	1.75	140	60	No...
Sparkbrook	1-70x90	346.4	.....	L	4	Spl...	2¾	J. A. P....	.....	.....	.....	Multi-d	Ch & b	St. Arch.	R	26x2½	.....	Rim..	V rim.	1.75	160	84	Yes..
Stanger	2-70x70	538.8	V	.....	2	Spl...	5	Own.....	11	7	4¾	Multi-d	Ch & b	St. Arch.	S	26x2½	.....	Rim..	V rim.	2.50	130	110	Yes..
Sun	1-70x64	246.5	.....	.....	2	Spl...	2½	Valveless..	9½	.....	5½	Plate...	Ch & b	St. Arch.	R	26x2¼	M. L...	Rim..	V rim.	1.5	170	44	Yes..
Sunbeam	1-85x88	499.3	.....	L	4	Spl...	3½	Own.....	14½	8	5¼	Multi-d	Chain.	Own....	R	26x2½	Lucas...	V rim.	Int...	1.75	240	126	No...
Sunbeam	1-77x105	488.9	.....	L	4	Spl...	3½	Own.....	9½	6	4	Multi-d	Chain.	Own....	R	26x2¾	Lucas...	V rim.	V rim.	1.5	225	138	Yes..
Sunbeam	1-85x105	595.8	.....	L	4	Spl...	4¼	Own.....	14½	8	5¼	Multi-d	Chain.	Own....	R	26x2½	Lucas...	V rim.	Int...	1.75	285	144	Yes..
Sunbeam	2-85x88	964.7	V	L	4	Spl...	8	J. A. P....	12	7	4½	Multi-d	Chain.	Own....	R	28x3	Lucas...	V rim.	Int...	1.75	330	168	No...
Triumph	1-64x70	225.2	.....	.....	2	Pet...	2¼	Own.....	10	.....	6	None...	Ch & b	Own....	R	26x2¼	M. L...	Rim..	V rim.	1.12	129	65	No...
Triumph	1-81x97	499.8	.....	H	4	Spl...	3½	Own.....	11¾	7	4¾	Multi-d	Chain.	Own....	R	26x3	M. L...	Rim..	V rim.	1.5	240	120	Yes..
Triumph	1-85x97	550.4	.....	L	4	Spl...	4	Own.....	13½	8	5	Multi-d	Ch & b	St. Arch.	R	26x2½	M. L...	Rim..	V rim.	1.5	230	105	No...
Triumph	1-85x97	550.4	.....	L	4	Spl...	4	Own.....	13½	8	4¾	Multi-d	Chain.	Own....	R	26x2½	M. L...	Rim..	V rim.	1.5	242	115	No...
Trump	1-70x76	292.4	.....	L	4	Spl...	2¾	J. A. P....	10	.....	5¼	None...	Ch & b	Ch. Lea.	R	26x2¼	.....	Rim..	V rim.	1.75	160	60	Yes..
Trump	1-85x85	482.3	.....	L	4	Spl...	4	J. A. P....	8	6	4	Multi-d	Chain.	St. Arch.	R	26x2½	.....	Rim..	V rim.	2.0	250	105	No...
Trump	2-76x85	772.0	V	L	4	Spl...	6	J. A. P....	8	6	4	Multi-d	Chain.	St. Arch.	R	24x2½	.....	Rim..	V rim.	2.0	260	130	No...
Velocette	1-62x73	220.4	.....	.....	2	Spl...	2¼	Own.....	9	.....	5	Multi-d	Chain.	Own....	R	24x2¼	M. L...	Int...	Int...	1.5	160	65	No...
Velocette	1-63x80	249.4	.....	.....	2	Spl...	2½	Own.....	14	9	5	Multi-d	Chain.	Own....	R	24x2¼	M. L...	Int...	Int...	1.5	170	68	Yes..
Verus	1-62x70	211.3	.....	.....	2	Spl...	2¼	Own.....	.....	.....	6	None...	Belt...	None....	R	26x2	.....	Rim..	V rim.	1.5	130	48	No...
Verus	1-70x70	269.4	.....	.....	2	Spl...	2½	Own.....	.....	.....	.....	Plate...	Ch & b	Burman.	R	24x2½	.....	Rim..	V rim.	1.5	160	60	No...
Verus	1-64x76	244.5	.....	L	4	Spl...	2¼	J. A. P....	.....	.....	.....	Plate...	Chain.	Burman.	R	24x2	.....	Int...	V rim.	1.5	150	95	Yes..
Verus	1-71x88	348.4	.....	L	4	Spl...	2¾	Blackb'r'e.	.....	.....	.....	Plate...	Ch & b	Burman.	R	26x2¼	.....	Rim..	V-rim.	1.5	190	77	Yes..
Verus	1-70x90	346.4	.....	L	4	Spl...	2¾	J. A. P....	.....	.....	.....	Plate...	Chain.	Burman.	R	26x2¼	M. L...	Int...	V rim.	1.5	210	92	Yes..
Verus	2-	.....	V	L	4	Spl...	6	Blackb'r'e.	.....	.....	.....	Multi-d	Chain.	St. Arch.	R	26x3	Lucas...	Int...	V rim.	1.5	260	135	Yes..
Wolf	1-70x70	269.4	.....	.....	2	Spl...	2½	Villiers....	.....	.....	.....	Plate...	Ch & b	Albion..	R	26x2¼	Villiers.	Rim..	V rim.	1.0	147	45	No...
Wolf	1-71x88	348.4	.....	L	4	Spl...	2¾	Blackb'r'e.	9	.....	5½	Multi-d	Ch & b	St. Arch.	R	26x2¼	.....	Rim..	V rim.	1.0	193	75	No...
Wolf	1-85x97	550.4	.....	L	4	Spl...	4¼	Blackb'r'e.	13½	8	5	Multi-d	Ch & b	St. Arch.	R	26x2½	.....	Rim..	V-rim.	1.5	224	95	No...
Zenith	2-68x68	493.8	Opp.	H	4	Spl...	3½	Bradshaw .	13¾	7	4¾	Multi-d	Chain.	St. Arch.	R	26x2½	.....	V rim.	V rim.	2.0	270	119	Yes..
Zenith	2-70x88	677.2	V	L	4	Spl...	5	J. A. P....	11¾	.....	5	Cone...	Belt...	None....	R	26x2½	.....	Rim..	V rim.	2.0	290	118	No...
Zenith	2-85x85	964.7	V	L	4	Spl...	8	J. A. P....	11	.....	4¼	Cone...	Belt...	None....	R	28x3	.....	V rim.	V rim.	2.0	320	130	No...

For abbreviations see preceding page.

British Motorcycle Trends

Popularity of 2½-2¾h.p. lightweight still increasing. Forty-six per cent of machines have stock engines and 58% stock gearsets. Brakes show improvement. Multiplicity of models feature of most British lines.

By M. W. Bourdon

FIRST observable just before the war and continued in 1919, the lightweight motorcycle movement in England has gained increased force and intensity during the past twelve months, and whereas until recently the mainstay of the British industry was the single cylinder four-cycle machine of from 3½ to 4 hp. weighing 250-300 lb., the honors are now fairly equally divided between that type and the lightweight with either a two-cycle or four-cycle engine of from 2½ to 2¾ hp. and turning the scale at 160 to 180 lb.

This smaller pattern has up to this year been sold exclusively for solo use, generally with a two-speed gear, but by no means infrequently with only a single ratio and direct belt drive. But for 1922 quite a number of makers have, after strengthening the frame and modifying the machine in one or two other details, put it forward for passenger work with a light sidecar. In this form with a three-speed gearset and chain-belt drive it has already established itself in the public favor, for although hitherto it has not been sold as a dual purpose machine it has been used quite extensively with sidecar attachments in 1921, owners having themselves fitted it up as a combination, despite the makers' warning that they did so at their own risk.

It should not be assumed from the foregoing that the medium-weight 3½-4 hp. single cylinder machine has been superseded by the light weight; that is not so, for it retains just as firm a hold as hitherto and the demand for the lighter and cheaper machines is additional—a demand, in fact, which constitutes almost an entirely new market for motorcycles. Favor is almost evenly given to two-cycle and four-cycle engines for lightweights, for taking all models of all makers up to 2¾ hp. the two-cycle engine is fitted to 52 per cent, which compares with 45 per cent at this time last year. When, however, one ignores limitations as to horsepower and includes all machines from the smallest to the largest (8 hp. two-cylinder), the four-cycle motor predominates, appearing on 75 per cent, a 5 per cent drop in twelve months.

Twelve months back the popularity of the 3½-4 hp. single cylinder was threatened by two-cylinder horizontally opposed engines, a number of new models appearing, offered at prices comparing favorably with the other type. But these two-cylinder medium-powered machines have not made much headway, and up to 5-6 hp. the single cylinder still holds the field.

One of the outstanding features of the British motorcycle industry of late has been the exceedingly large number of new models of all types put forward for 1922. This will be realized to the full when it is said that of the 160 machines dealt with in the accompanying specification table 49.5 per cent are new models. Admittedly, in many cases they are based upon 1921 models and embody additional rather than new and substituted features. Further, the old models are retained as optional patterns, which results in a great many makers offering a large variety of types. As will be seen from the table, a one-model policy is quite exceptional; many firms offer four alternative types and half a dozen are listed in some cases. One firm actually catalogues 12 models under two different names, these ranging from a 2½ hp. lightweight with two-cycle engine to an 8 hp. twin-cylinder four-cycle.

The tendency for motorcycle makers to fit stock engines and gearsets continues, and 46 per cent of all machines have engines made by specialists, while stock gearsets appear on 58 per cent. Also as hitherto, the J. A. P. engines predominate among stock productions, though as the makers of this range do not supply a two-cycle motor, the percentage of their productions in stock engines used by all manufacturers has fallen from 60 to 53 per cent in twelve months. Fifty-four per cent of engines are made by the motorcycle manufacturers, while the two-cycle Villiers stock engine with its flywheel magneto now has the chief representation in this type, viz. 44 per cent. For the first time a sleeve valve engine has made its appearance on British motorcycles, this being the Barr & Stroud, made under the Burt & McCullum (Argyll) patents with a single interior sleeve. Among multi-cylinder engines the V type continues to predominate, and has, in fact, gained slightly during the year; it now occurs on 76 per cent of the two-cylinder engines as compared with 20 per cent horizontally opposed, the remaining 4 per cent having cylinders side by side, slightly inclined, and are of the two-cycle type. Last year British motorcycles included a three-cylinder and a four-cylinder model, but these have now disappeared. Cylinder heads are detachable in only 21 per cent of all engines, and valves in the head, while they have increased slightly, hold a representation of less than 7 per cent. One maker—Martinsyde—has a peculiar valve arrangement, the exhaust being overhead and the inlet at the side of the cylinder, the exhaust valve being accommodated in a detachable cage and seating. There are two or three examples of overhead inlets with side exhaust.

A marked variation in design is the increased number of anti-friction bearings (ball and roller) in place of plain gun-metal bushes for the crankshaft and big-end. It still remains usual practice, however, to fit a plain bearing on the timing side of the crankshaft, 65 per cent of engines having this arrangement with either a ball or roller bearing on the driving side. Roller bearings are favored far and away in preference to the ball variety for connecting rod big-ends, the respective percentages being 55 and 3 per cent, the remainder being plain. The majority (75 per cent) of wrist pins are still attached to the piston bosses, though there has been an appreciable increase in the number which float in both piston and rod, the percentage in this respect having increased from 4 to 17. Splash lubrication still predominates with 84.5 per cent.

Tendencies in British Motorcycle Design

Engine, Two or Four-Cycle

Four .....75 per cent
Two .....25 per cent

Up to 2¾ Hp.

Two-cycle .....52 per cent
Four-cycle .....48 per cent

No. of Cylinders

1 .....60 per cent
2 .....40 per cent

Engine, Make

Own .....54 per cent
Stock .....46 per cent

Multi Cylinder Arrangement

V .....76 per cent
Hor. opposed .....20 per cent
Inclined ..... 4 per cent

Cylinder Head Detachable?

No .....79 per cent
Yes .....21 per cent

Engine Bearings, Driving Side

Plain .....47 per cent
Ball .....33 per cent
Roller .....17.5 per cent
Plain and Ball .....2.5 per cent

Timing Side

Plain .....65 per cent
Ball .....23 per cent
Roller ..... 9 per cent
Plain and ball ..... 3 per cent

Big-End

Roller .....55 per cent
Plain .....42 per cent
Ball ..... 3 per cent

Valve Arrangement

L head .....62.5 per cent
Valveless .....25 per cent
Overhead (I) .....6.9 per cent
Overhead Inlet (F) .....4.4 per cent
Overhead Exhaust ..... .6 per cent
Sleeve ..... .6 per cent

Wrist Pin Fixing

In piston bosses .....75 per cent
Floating .....17 per cent
In connecting rod ..... 8 per cent

Lubricating System

Splash .....84.5 per cent
Circulating splash .....7 per cent
Splash and pressure .....3 per cent
Petroil .....2.5 per cent
Pressure .....1.5 per cent
Hollow shaft, drip feed .....1.5 per cent

Clutch Type

Plate .....60 per cent
Multi plate .....35 per cent
expanding cone, expanding band, expanding ring .....5 per cent

Clutch Control Hand or Foot

Hand .....88 per cent
Foot .....10 per cent
H & F ..... 2 per cent

Gearset

Stock .....58 per cent
Own .....42 per cent

No. of Speeds

3 .....62.5 per cent
2 .....31.5 per cent
1 .....3.25 per cent
Variable (expanding pulley) 2 per cent
4 ..... .75 per cent

Gearset Location

Separate .....98 per cent
Unit ..... 2 per cent

Type of Transmission

Chain .....51 per cent
Chain and belt .....41 per cent
Belt ..... 8 per cent

Frame

Rigid .....90 per cent
Sprung ..... 8 per cent
Optional ..... 2 per cent

Wheels; Detachable and Interchangeable

No .....90 per cent
Yes .....10 per cent

Brakes, Front

Tyre rim .....50 per cent
V rim .....26 per cent
Expanding shoes .....17.5 per cent
Band ..... 3.5 per cent
Shoe ..... 3 per cent

Brakes, Rear

V rim .....64 per cent
Expanding shoes .....22 per cent
Band ..... 4 per cent
Two V rim ..... 3 per cent
Expanding and band .....2.5 per cent
Shoe .....2.5 per cent
Two expanding .....2 per cent

German Motorcycle Specifications

NAME AND MODEL	POWER PLANT								TRANSMISSION				FRAME AND WHEELS				MISCELLANEOUS					
	CYLINDERS		Piston Displacement (Cu. In.)	Cycle Type	Lubrication Type	Carburetor Make	Ignition Make	Maximum H. P.	Number of Speeds	Change Speed Gear Type	Clutch Type	Final Drive Type	Wheelbase (Ins.)	Frame Made From	Front Forks Type	Tire Size (Ins.)	Starting System	Lighting System	Brakes: No. and Type	Fuel Tank Capacity in Gals.	Weight Ready For Road (Lbs.)	Maximum Speed M. P. H.
	Number Bore and Stroke	Arrangements																				
Adria.....R	1-67x80	Vert..	22.3	4	Spl...	Meco.....	Bosch...	2.5	1	.....	None..	Belt....	49.7	Stl-tube.	Spr...	26x2	P.....	None..	1-Ext...	1.06	124	40
Ardie.....2HP	1-70x75	Vert..	17.6	2	O&G..	Opt.....	Eise....	2.3	2	Prog..	Cone..	Belt....	53.2	Stl-tube.	Spr...	26x2½	K....	None..	2-Int....	2.38	172	37
Golem..Chair Type	1-50x60	Hor...	7.2	2	O&G..	Pallas.....	Fly-wh..	1	1	.....	Cone..	Chn. Blt.	47.3	Stl-tube.	Spr...	15x2⅛	K....	None..	1-Ext...	.....	77	25
K. C.....2HP	2-51.5x62	Opp...	15.7	2	O&G..	Own.....	Bosch...	2	1	.....	Cone..	Chn....	50.5	.....	Bicy..	24x2	P.....	None..	1-Ext...	1.45	121	34
Kreiger.....4HP	1-80x99	Vert..	30.7	4	Force.	Opt.....	Bosch...	4	3	Slid...	Cone..	Car-shft.	55.2	Stl-tube.	Spr...	28x2½	K....	None..	2-Ext...	2.64	247	47
Krupp.....Scooter	1-60x70	Vert..	12.1	4	Spl...	Tuto.....	Fly-wh..	1.55	1	.....	Disk..	Sp-gear..	47.3	Pr-sheet.	Spr...	15x2¼	.....	None..	2-Int....	0.40	99	25
Lomos..Chair Type	1-55x60	Obl...	8.7	2	O&G..	Tuto.....	Bosch...	1.2	1	.....	Cone..	Belt....	53.2	Stl-tube.	Spr...	20x2	.....	None..	2-Int....	1.32	121	31
Lorenz.....Scooter	1-62x70	Vert..	12.9	4	Spl...	Meco.....	Bosch...	1.6	1	.....	Cone..	Belt....	49.2	Pr-sheet.	Spr...	15x2¼	.....	None..	1-Ext...	0.79	110	19
Mars.....A20	2-80x95	Opp...	58.3	4	Force.	Pallas.....	Bosch...	7.3	2	Slid...	Exp...	Chn.....	58.8	Pr-sheet.	Spr...	28x3	H.....	None..	2-Ext...	3.09	304	50
Megola..Chair Type	5-52x60	Rot...	38.9	4	Spl...	Zenith....	Bosch...	4.88	1	Plan...	.....	D-fr-wh.	55.2	Pr-sheet.	Spr...	28x3	K....	None..	2-Int....	4.76	242	47
M. F. Z.....2HP	1-64x77	Vert..	15.3	4	Force.	Graetzin...	Bosch...	2.5	2	Slid...	Disk..	Belt....	52.0	Stl-tube.	Spr...	26x2¼	K....	Bosch.	1-Rim...	2.38	132	43
N. S. U.....2HP	1-66x71	Vert..	15.3	4	Force.	Pallas.....	Bosch...	2.2	2	Slid...	Disk..	Belt....	52.4	Stl-tube.	Spr...	26x2¼	K....	None..	1-Rim...	1.85	154	37
N. S. U.....3HP	1-75x80	Vert..	21.6	4	Force.	Pallas.....	Bosch...	3	2	Hub..	.....	Belt....	52.8	Stl-tube.	Spr...	26x2½	K....	None..	2-Ext...	1.98	232	40
N. S. U.....4HP	2-63x80	Vee...	30.4	4	Force.	Pallas.....	Bosch...	4.5	3	Slid...	Disk..	Belt....	54.3	Stl-tube.	Spr...	26x2½	K....	None..	2-Ext...	2.11	221	50
N. S. U.....8HP	2-80x99	Vee...	60.7	4	Force.	Pallas.....	Bosch...	8	3	Slid...	Disk..	Chn....	58.3	Stl-tube.	Spr...	28x3	K....	Bosch.	2-Int....	2.38	309	62
Pawa.....1.5HP	1-60x80	Vert..	13.8	2	Spl...	Tuto.....	Bosch...	1.7	1	.....	Cone..	Belt....	54.3	Stl-tube.	Spr...	20x2½	K....	None..	2-Ext...	0.79	110	37
Postler.....Scooter	1-65x76	Vert..	15.4	4	Force.	Zenith....	Bosch...	1.8	2	Hub..	Spr...	Belt....	50.5	Pr-sheet.	Spr...	15x2¼	.....	None..	2-Ext...	0.53	137	28
Star.....3HP	2-61x67	Opp...	24.0	4	Force.	Pallas.....	Opt.....	3	3	Slid...	D-d..	Chn....	57.2	Stl-tube.	Spr...	26x2¼	K....	Bosch.	2-Int....	2.64	187	40
Tautz.....Scooter	1-50x60	Hor...	7.2	2	O&G..	Adria.....	Eise....	1	1	.....	Cone..	Chn....	48.8	Pr-sheet.	Spr...	20x1¾	.....	None..	1-Int....	0.79	75	25
Triumph.....2HP	1-70x72	Vert..	16.4	2	O&G..	Own.....	Bosch...	2.6	2	Hub..	.....	Belt....	49.2	Stl-tube.	Spr...	26x2¼	None..	None..	2-Ext...	1.85	137	37
Victoria.....3HP	2-68x68	Opp...	30.1	4	Force.	Opt.....	Bosch...	4	2	Prog..	Cone..	Belt....	58.3	Stl-tube.	Spr...	26x2½	K....	Fenag.	2-Ext...	3.17	242	47
Wanderer.....2HP	1-70x85	Vert..	19.9	4	Force.	Own.....	Bosch...	2.5	2	Prog..	Disk..	Belt....	54.2	Stl-tube.	Spr...	26x2¼	K....	None..	2-Int....	1.98	242	37
Wanderer.....4HP	2-70x80	Vee...	37.6	4	Force.	Own.....	Bosch...	4.5	3	Prog..	Disk..	Chn....	55.2	Stl-tube.	Spr...	26x2½	K....	None..	2-Int....	2.64	276	53
Wegro.....3HP	2-60x80	Vert..	27.6	2	O&G..	Tuto.....	Bosch...	3.5	1	.....	Disk..	Chn....	55.9	Stl-tube.	Spr...	28x3	K....	Bosch.	2-Ext...	2.64	199	68

American Stock Engine Speci

MAKE AND MODEL	Designed for (Cars, Trucks, Tractors)	No. of Cylinders, Bore and Stroke	Engine Type	Cylinder Type	Cylinders Cast?	Cylinder Heads	Piston Material	Name of Alloy	No. of Piston Rings	Piston Pin Diameter	Piston Length	Piston Weight	Valve Clear Diameter	Valve Lift	Valve Head Material	Crankcase Integral With Cylinders?	Crankcase Material	Material of Lower Half	Cooling System	Oiling System	Pressure Regulation by Intake Vacuum	Oil Pump Type
Beaver JA	Trucks	4-4½x6	Ver	I-head	4	Det	Iron		4	1⅛	5⅛	5¾	2⅜	⅜	C-steel		Iron	Iron	Pump	Hol-crk		Gear
Beaver CL	Cars	6-3½x5½	Ver	I-head	6	Det	Iron		4	1.09	4¾		1¾	⅜	Tung		Al	Al	Pump	Hol-crk		Gear
Beaver JB	Tractors	4-4¾x6	Ver	I-head	4	Det	Iron		4	1⅛	5⅝	6¾	2⅜	⅜	C-steel		Iron	Iron	Pump	Hol-crk		Gear
Buda ATU		4-5 x6½	Ver	L-head	4	Det	Iron		4	1⅜	6¾		2¼	⅜	Ch-steel		Iron	Iron	Pump	Hol-crk		Gear
Buda BTU		4-4¾x6½	Ver	L-head	4	Det	Iron		4	1⅜	6¾		2¼	⅝–⅝	Ch-steel		Iron	Iron	Pump	Hol-crk		Gear
Buda MU	C,T,Tr	4-3⅝x5⅛	Ver	L-head	4	Det	Iron		4	1⅛	4½		1⅝	9/32–⅝	Ch-steel		Iron	Iron	Pump	Hol-crk		Gear
Buda YTU	T,Tr	4-4½x6	Ver	L-head	4	Det	Iron		4	1¼	6¼		2⅛	9/32–⅝	Ch-steel		Iron	Iron	Pump	Hol-crk		Gear
Buda ETU	T,Tr	4-4¼x5½	Ver	L-head	4	Det	Iron		4	1⅛	5⅝		1⅞	9/32–⅝	Ch-steel		Iron	Iron	Pump	Hol-crk		Gear
Buda FTU	T,Tr	4-4 x5½	Ver	L-head	4	Det	Iron		4	1⅛	5⅜		1⅞	9/32–⅝	Ch-steel		Iron	Iron	Pump	Hol-crk		Gear
Buda CTU	T,Tr	4-3¾x5¼	Ver	L-head	4		Iron		4	1¼	5		1⅝	9/32–⅝	Ch-steel		Iron	Iron	Pump	Hol-crk		Gear
Climax K	T,Tr	4-5 x6½	Ver	L-head	2	Det	Iron		3	1 13/64	5¾	5½	2¼	⅜	C-iron		Iron	Iron	Pump	Hol-crk	No	Eco
Climax KU	T,Tr	4-5 x6½	Ver	L-head	2	Det	Iron		3	1 13/64	5¾	5½	2¼	⅜	C-iron		Iron	Iron	Pump	Hol-crk	No	Eco
Climax TU	T,Tr	4-5½x7	Ver	L-head	2	Det	Iron		3	1 11/32	7	8¾	2¼	⅜	C-iron		Iron	Iron	Pump	Hol-crk	No	Eco
Continental 7R	Cars,T	6-3½x4½	Ver	L-head	6	Det	Iron		3	11/16	4⅛	32	1½	⅜	Steel			Al	P-stl	Pump	Hol-crk	No	Gear
Continental E4	T,Tr	4-4½x5½	Ver	L-head	2	Int	Iron		3	1⅞	5⅝		2¼	⅜	Steel			Al	Al	Pump	Cir-spl	No	Pist
Continental E7	Trucks	4-4½x5½	Ver	L-head	2	Int			3	1⅞	5⅝		2 1/64	⅜	Steel			Al	P-stl	P,T	Cir-spl	No	Pist
Continental C2	T,Tr	4-4½x5¼	Ver	L-head	4	Int	Iron		3	1⅞	5¼		1 7/8	⅜	Steel			Al	Al	Pump	Cir-spl	No	Pist
Continental C4	Trucks	4-4½x5¼	Ver	L-head	4	Int	Iron		3	1⅞	5⅛		1 7/8	⅜	Steel	Sep		Al	Al	Pump	Cir-spl	No	Pist
Continental N	Cars,T	4-3¾x5	Ver	L-head	4	Int	Iron		3	1 3/32	3¾	3¼	1 11/32		Al			Al	p-stl	P,T	Cir-spl	No	Pist
Continental B2	T,Tr	4-4¾x6	Ver	L-head	2	Det	Iron		3	1⅜	6⅛	7 11/32	2⅛	1 1/32	Al			Al	Al	Pump	Hol-crk	No	Gear
Continental 9N	Trucks	6-3½x5¼	Ver	L-head	6	Int	Iron		3	1 3/32	4¼	3¼	1 11/32	3/32–1 1/32				Al	P-stl	Pump	Cir-spl	No	Pist
Erd D	Tractors	4-4½x6	Ver	I-head	4	Det	Iron	C-iron	3	1¼	5¼	3⅝	1⅝	⅜	Steel			Iron	Al	Pump	Hol-crk		Gear
Falls X-9000	Cars	6-3½x4¼	Ver	I-head	6	Det	Iron		3	¾			1¼	9/32	Steel	Yes	Iron	Iron	Ther	Cir-spl	No	Ecc
G. B. & S AA	C,T,Tr	4-3¾x5	Ver	L-head	4	Int	Iron		3	1 3/32	3⅜	3½	1 13/64	2 3/64				Al	Al	Pump	Hol-crk		Gear
G. B. & S SS	Cars,T	4-3¾x4¼	Ver	L-head	4	Det	Iron		3	¾	3⅜	2⅝	1⅝	7/32	Steel	Sep	Iron	P-stl	Ther	Cir-spl		Pist
Gray-Beall K	Cars	4-3½x5	Ver	I-head	4	Det	Iron		3	1	3⅞	1½	1⅝	9/32	Steel	Yes	Iron	P-stl		Cir-spl	No	Gear
Gray-Beall T	C,T,Tr	4-3½x5	Ver	I-head	4	Det	Iron		3	1	3⅞	1½	1⅝	9/32	Steel	Yes	Iron	P-stl		Cir-spl	No	Gear
Hercules CU2	T,Tr	4-3¾x5½	Ver	L-head	4	Det	Iron		4	1⅛	4⅞	4½	1⅝	1 1/32	Steel	No	Iron	Iron	Pump	Hol-crk	No	Gear
Hercules CU3	T,Tr	4-4 x5½	Ver	L-head	4	Det	Iron		4	1⅛	4⅞	4⅝	1⅝	1 1/32	Steel	No	Iron	Iron	Pump	Hol-crk	No	Gear
Hercules MU2	T,Tr	4-4½x5½	Ver	L-head	4	Det	Iron		4	1¼	5⅛	5	1⅞	1 1/32	Steel	No	Iron	Iron	Pump	Hol-crk	No	Gear
Hercules MU3	T,Tr	4-4½x5½	Ver	L-head	4	Det	Iron		4	1¼	5⅛	5⅝	1⅞	1 1/32	Steel	No	Iron	Iron	Pump	Hol-crk	No	Gear
Hercules TU	T,Tr	4-4¾x6	Ver	L-head	2	Det	Iron		4	1⅜	5⅝	7¼	2⅛	1 1/32	Steel	No		Al	Al	Pump	Hol-crk	No	Gear
Hercules T3	T,Tr	4-5 x6	Ver	L-head	2	Det	Iron		4	1⅜	5⅝	8½	2⅛	1 1/32	Steel	No		Al	Al	Pump	Hol-crk	No	Gear
Herschell-Spillman 90	Cars	6-3½x5	Ver	L-head	6	Det	Iron		3	⅞	3⅜			⅜	Steel	Yes		S-stl	P-stl	Pump	Cir-spl		Gear
Herschell-Spillman 7000	C,T,Tr	4-3½x5	Ver	L-head	4	Det	Iron		3	⅞	3⅜		1⅝	⅜	Steel	Yes		S-stl	P-stl	Ther	Cir-spl		Gear
Herschell-Spillman 11000	Cars	6-3½x5	Ver	L-head	6	Det	Iron		3	⅞	3⅜		1⅝	⅜		Yes		S-stl	P-stl	Pump	Cir-spl		Gear
Highway AA	Cars,T	4-3¾x5	Ver	L-head	4	Int	I or A	Lynite	3	1 3/32	3¾	1¼	1⅞	1 13/64	C-iron			Al	Al	Pump	Hol-crk	No	Gear
Hinkley 300	T,Tr	4-3¾x5¼	Ver	L-head	4	Det	Iron		3	1⅛	4¾		1¾	⅜	C-iron			S-stl	P-stl	Pump	Hol-crk	No	Gear
Hinkley 400	T,Tr	4-4 x5½	Ver	L-head	4	Det	Iron		3	1⅛	4½		1¾	⅜	C-iron			S-stl	P-stl	Pump	Hol-crk	No	Gear
Hinkley 500	T,Tr	4-4½x5½	Ver	L-head	4	Det	Iron		3	1¼	5¼		2	⅜	C-iron			S-stl	Al	Pump	Hol-crk	No	Gear
Hinkley 200	T,Tr	4-4½x5½	Ver	L-head	4	Det	Iron		3	1¼	5¼		2	⅜	C-iron			S-stl	Al	Pump	Hol-crk	No	Gear
Hinkley 1600	T,Tr	4-4½x5½	Ver	I-head	4	Det	Iron		3	1¼	5¼		2	⅜	C-iron			S-stl	Al	Pump	Hol-crk	No	Gear
Le Roi 2C	C,T,Tr	4-3½x4½	Ver	L-head	4	Det	Iron		3	⅞	3¾		1⅝	⅜	C-iron	Yes	C-stl		Ther	Cir-spl		Pist
Lycoming K, KA, KB, KC	C,T,Tr	4-3½x5	Ver	L-head	4	Det	Iron		3	⅞	4	1⅜	1⅝	1 1/64	C-iron	No	Iron	P-stl	Ther	Cir-spl	No	Pist
Matthews F	C,T,Tr	4-3½x5	Ver	L-head	4	Det	Iron		3	⅞	3 21/32	2.4	1⅝		C-iron	Yes		P-stl	P,T	Cir-spl		Gear
Matthews LM	Cars,T	4-3⅞x4	Ver	L-head	4	Det	Iron		3	4 1/64	4¼	3.5	1⅝	25/100–¼	C-iron	Yes		Al,pst	Ther	Cir-spl		Gear
Midwest 400	T,Tr	4-4½x6	Ver	V-head	2	Det	Iron		3	1¼	5½	6⅝	2¼	7/32	A	Sep	Iron	Iron	Pump	Hol-crk	Yes	Gear
Midwest 402	T,Tr	4-4½x5½	Ver	V-head	2	Det	Iron		3	1⅛	5½	8	1⅞	5/16–⅜	A	Sep	Iron	P-stl	Pump	Hol-crk	Yes	Gear
Midwest 408	C,T,Tr	4-3⅝x5	Ver	V-head	4	Det	Iron		3	1	4½	2⅝	1⅝	⅜	A	Yes	Iron	Al	Pump	Hol-crk	Yes	Gear
Midwest 409	C,T,Tr	4-3½x5½	Ver	V-head	4	Det	Iron		3	⅞	3⅝		1⅝	⅜	A	Yes	Iron	Al	Ther	Hol-crk	Yes	Gear
Northway 80	Trucks	4-3½x5½	Ver	L-head		Det	Iron		4	1 3/64	4⅜	3⅛	1⅝	5/100	Ch-stl	Yes	Iron	Al	T,P	Hol-crk	No	Gear
Northway 84	Trucks	4-4 x5½	Ver	L-head		Det	Iron		4	1 13/64	5¼					Yes	Iron	Al	T,P	Hol-crk	No	Gear
Northway 88	Trucks	4-4½x6	Ver	L-head	1	Det	Iron		4	1 13/64	6	5.8	2¼	⅜	Ch-stl	Yes	Iron	Al	T,P	Hol-crk	No	Gear
Northway 309	Cars	8-3½x4½	V	L-head	4	Det	A	Lynite	4	25/64	4¾	1⅜	1⅜	⅜	Ch-stl	Yes	Iron	P-stl	Pump	Hol-crk	No	Gear
Pittsburgh 92	Cars	8-3½x5	V	L-head	4	Det	Iron		3	⅞	3½	2.06	1⅜	⅛	P-stl			Al	Al	Pump	Hol-crk	No	Gear
Pittsburgh 93	Cars,T	4-3½x4¾	Ver	L-head	4	Det	Iron		3	⅞	4¾	2.13	1⅛	¼	P-stl	Yes	Iron	P-stl	Ther	Cir-spl		Pist
Reliable T	Tractors	2-6 x7	Hor	V-head	2	Det	Iron		3	1¾	7	28	2½	½	N-stl		Iron		Ther			Pist
Reliable 00	Tractors	2-6 x6	Hor	V-head		Det	Iron	20%S	3	1⅝	7⅛	24	2½	½	N-stl	Yes	S-stl		Pump	Hol-crk		Pist
Rochester G-1	Cars	4-4½x6	Ver	V-head	4	Int	A	Lynite	3	1¼	4¾	16.9	2	3/4	A, tung			Al	Al	Pump	Hol-crk	No	Gear
Rochester 1000	Cars	6-3½x5	Ver	L-head	6	Det	A	Lynite	3	1 3/32	4	1⅜	1⅜	⅜	A			Al	Al	Pump	Hol-crk	No	Gear
Rutenber 25	Cars	6-3½x5	Hor	L-head	6	Det	Iron	C-iron	4	¾	3¾	1⅜	1⅜	⅜	C-iron	Yes	C-iron	P-stl	Pump	Cir-spl		Pist
Stearns A	T,Tr	4-4¾x6½	Ver	V-head	4	Det	Iron		4	1⅝	6		2¼	⅜	N-stl		Iron	Al	Pump	Hol-crk		Gear
Stearns AU	T,Tr	4-4¾x6½	Ver	V-head	4	Det	Iron		4	1⅝	6		2¼	⅜	N-stl		Iron	Al	Pump	Hol-crk		Gear
Stearns B	T,Tr	4-5 x6½	Ver	V-head	4	Det	Iron		4	1⅝	6		2¼	⅜	N-stl		Iron	Al	Pump	Hol-crk		Gear
Stearns BU	T,Tr	4-5½x6½	Ver	V-head	4	Det	Iron		4	1⅝	6		2¼	⅜	N-stl		Iron	Al	Pump	Hol-crk		Gear
Stearns G	T,Tr	4-4½x6	Ver	V-head	4	Det	Iron		4	1⅜	5¾		2	⅜	N-stl			Al	Al	Pump	Hol-crk		Gear
Stearns GU	T,Tr	4-4¼x6	Ver	V-head	4	Det	Iron		4	1⅜	5¾		2	⅜	N-stl			Al	Al	Pump	Hol-crk		Gear
Stearns H	T,Tr	4-4½x6	Ver	V-head	4	Det	Iron		4	1⅜	5¾		2	⅜	N-stl			Al	Al	Pump	Hol-crk		Gear
Stearns HU	T,Tr	4-4½x6	Ver	V-head	4	Det	Iron		4	1⅜	5¾		2	⅜	N-stl			Al	Al	Pump	Hol-crk		Gear
Stearns F	T,Tr	4-4 x6	Ver	V-head	4	Det	Iron		4	1⅜	5¾		2	⅜	N-stl			Al	Al	Pump	Hol-crk		Gear
Stearns FU	T,Tr	4-4 x6	Ver	V-head	4	Det	Iron		4	1⅜	5¾		2	⅜	N-stl			Al	Al	Pump	Hol-crk		Gear
Sphinx A	Cars	6-3½x4½	Ver	T-head	6	Det	Iron		3	⅞	4					Yes	Iron	Al	Pump	Hol-crk	No	Gear
Supreme 5K	Cars	6-3½x5	Ver	L-head	6	Det	Iron		3	⅞	4⅛	1⅛	1⅝	9/16	N-stl	Yes	Iron	P-stl	Pump	Hol-crk	No	Gear
Supreme S4	C,T,Tr	4-3⅝x5	Ver	L-head	4	Det	Iron		3	⅞	4⅛	1⅝	1⅝	9/16	N-stl	Yes	Iron	P-stl	Ther	Hol-crk	No	Gear
Turmo O	Cars	4-3 x5	Ver	L-head	4	Int	Iron		2	¾	3¼		1⅜	⅝	Iron		Iron	Iron	Ther	Hol-crk	No	Gear
Turmo N	Tractors	4-3 x4½	Ver	L-head	4	Int	Iron	S-stl	2	¾	3¼		1⅜	⅝	Iron		Iron	P-stl	Ther	Cir-spl	No	Pist
Turmo H	C,T,Tr	4-3¾x5	Ver	L-head	4	Det	Iron		4	1	3⅞		1⅝	⅜	Iron		S-stl	P-stl	Pump	Hol-crk		Gear
Turmo S	Cars	4-3½x5	Ver	L-head	4	Det	Iron		3	⅞	3¾		1⅝	⅜	Iron		S-stl	I-P-st	Ther	Hol-crk		Gear
Twin City TW	T,Tr	4-4¼x6	Ver	I-head	4	Det	Iron	C-iron	4	1¼	5 11/32	5	1⅜	⅜	Ch-nic	Yes	Iron	P-stl	Pump	Hol-crk	No	Gear
Twin City AE	Tractors	4-5½x6¾	Ver	I-head	4	Det	Iron	C-iron	5	1⅝	6¾	9¾	1¾	⅜	Ch-nic	Yes	Iron	Al	Pump	Hol-crk	No	Gear
Twin City BE	Tractors	4-7¾x9	Ver	I-head	1	Det	Iron	C-iron	4	2⅝	10¼	1⅝	3	1 1/32	C-iron		Iron	Iron	Pump	Spl, FF		
Waukesha EU	T,Tr	4-5 x6¼	Ver	L-head	2	Det	Iron		3	1⅜	6½	8⅜	2⅛	1 1/32	Spec-a			Al	Iron	Pump	Hol-crk	No	Gear
Waukesha DU	T,Tr	4-4½x6¼	Ver	L-head	2	Det	Iron		3	1⅜	5⅞	7½		1 1/32				Al	Iron	Pump	Hol-crk	No	Gear
Waukesha CU	T,Tr	4-4¾x5¾	Ver	L-head	2	Det	Iron		3	1¼	5⅝	6¼		1 1/32	Spec-a			Al	Iron	Pump	Hol-crk	No	Gear
Waukesha FU	T,Tr	4-4 x5¾	Ver	L-head	2	Det	Iron		3	1¼	5⅝			1 1/32	Spec-a			Al	Al, I	Pump	Hol-crk	No	Gear
Waukesha BUX	T,Tr	4-3¾x5¾	Ver	L-head		Det	Iron		4	1	3⅞	3½		⅝	Spec-a			Al	Iron	Pump	Cir-spl	No	Gear
Weidely M	T,Tr	4-3¾x5½	Ver	I-head	4	Det	Iron		4	1	4½	3⅝	1⅞	⅜	C-I, St	Yes	Iron	Iron	Pump	Hol-crk	No	Gear
Weidely MAU	T,Tr	4-4 x5½	Ver	I-head	4	Det	Iron		3	1	4⅜	2½	1⅞	⅜	Steel	Yes		Iron	Pump	Hol-crk	No	Gear
Weidely MAU2	Trucks	4-3¾x5½	Ver	L-head	4	Det	Iron		3	1	4⅜	2⅜	1⅞	⅜	Steel	Yes		Iron	Pump	Hol-crk	No	Gear
Weidely MAT	Cars	4-3¾x5½	Ver	I-head	4	Det	Iron		3	1	4⅜	2⅜	1⅞	⅜	Steel	Yes	Iron	Al	Pump	Hol-crk	No	Gear
Weidely MAT	Trucks	4-3¾x5½	Ver	I-head	4	Det	Iron		3	1	4⅜	2⅜	1⅞	⅜	Steel	Yes		Iron	Pump	Hol-crk	No	
Weidely MA	Trucks	4-3¾x5½	Ver	I-head	4	Det	Iron		3	1	4⅜	2⅜	1⅞	⅜	Steel	Yes	Iron	Iron	Pump	Hol-crk	No	Gear
Weidely C	Cars	12-2⅞x5	V	I-head	3	Det	Iron		3	5/8	3½	1⅜	1⅝	½	Steel			Al	Al	Pump	Hol-crk	No	Gear
Wisconsin CAU	T,Tr	4-3¾x5	Ver	L-head	4	Int	Iron		3	1⅜	5 11/32	4⅜	1½	⅝	Ch-nic			Al	Al	Pump	Hol-crk	No	Gear
Wisconsin EAU	T,Tr	4-4 x5	Ver	L-head	4	Int	Iron		3	1⅜	4 23/32	4⅝	1½	⅝	Ch-nic			Al	Al	Pump	Hol-crk	No	Gear
Wisconsin TAU	T,Tr	4-4 x6	Ver	L-head	4	Det	Iron		3	1⅜	5⅝	4⅝	2 11/32		Ch-nic			Al	Al	Pump	Hol-crk		Gear
Wisconsin UAU	T,Tr	4-4¼x6	Ver	L-head	4	Det	Iron		3	1⅜	5⅛	4⅞	2 11/32		Ch-nic			Al	Al	Pump	Hol-crk		Gear
Wisconsin VAU	T,Tr	4-4½x6	Ver	L-head	4	Det	Iron		3	1⅜	4⅝	4⅝	2 11/32		Ch-nic			Al	Al	Pump	Hol-crk		Gear
Wisconsin RAU	T,Tr	4-4¾x6	Ver	L-head	2	Det	Iron		3	1⅜	6⅛	6⅛	2⅛		Ch-nic			Al	Al	Pump	Hol-crk		Gear
Wisconsin RBU	T,Tr	4-5 x6	Ver	L-head	2	Det	Iron		3	1⅜	5 11/32	6⅛	2⅛		Ch-nic			Al	Al	Pump	Hol-crk		Gear
Wisconsin M	T,Tr	4-5¾x7	Ver	T-head	2	Int	Iron		4	1⅞	5¼	10⅛	2 1/32	⅝	Ch-nic			Al	Al	Pump	Hol-crk		Gear
Wisconsin P	Trucks	6-5¾x7	Ver	T-head	2	Int	Iron		4	1⅞	5¼	10⅛	2 1/32	⅝	Ch-nic		Bron	Al	Pump	Hol-crk		Gear

A-Steel—Alloy Steel
A—Alloy
Al—Aluminum
C-Steel—Carbon Steel
Cent—Centrifugal
Cam—Camshaft
Ch-Stl—Chrome Steel
C-Iron—Cast Iron
Cir Spl—Circulating Splash
Det—Detachable
Ecc—Eccentric
F F—Force Feed
Hor—Horizontal
Hol Crk—Hollow Crankshaft
H-Gear—Helical Gear

fications for 1922

Connecting Rod Material	Connecting Rod C. to C. Length	Connecting Rod Weight	Crankshaft Material	No. of Crankshaft Bearings	Crankpin Diameter	Main Bearing Diameter	LENGTH OF CRANKSHAFT BEARINGS: Front	LENGTH OF CRANKSHAFT BEARINGS: Rear	Camshaft Location	Camshaft Drive	Speed of Max. H.P.	Is Governor Fitted?	Type of Governor	Governor Speed	Weight of Engine	Overall Width	Overall Height	Overall Length	Engine Adapted for Kerosene?	Bell Housing Provided?	No. and Type of Bell Housing	MAKE AND MODEL
C-stl	12½	8	C-stl	3	2¼	2.37	3½	4½	In-Crk	H-gear	1200	Yes	Cent	950-1000	1100	23½	39	50-¼	Yes	Yes	S.A.E-2	Beaver JA
C-stl	11	4¼	C-stl	3	2¼	2.29	2¾	2¾	In crk	Sil-ch	2400	No			700	25¾	34⅛	51½	No	Yes	S.A.E-3	Beaver CL
C-stl	12½	8	C-stl	3	2¼	2.37	3½	3½	In crk	H-gear	1200	Yes	Cent	950-1000	1100	23½	39	50⅛	Yes	Yes	S.AE.2	Beaver JB
A-stl	14⅜		A-stl	3	2½	3.19	3⅞	4¾	In crk	H-gear	1100	Opt		900		28¾	37½	47⅜	No	Yes	S.A.E-1	Buda ATU
C-stl	11¼		C-stl	3	2¼	2.25	3¼		In crk	H-gear	1100	Opt		900		28¾	37½	47⅜	No	Yes	S.A.E-1	Buda BTU
A-stl	13¼		A-stl	3	1⅞	1.95	2½	3	In crk	H-gear	1400-1600	No				28¾	30⅞	33⅜	No	Yes	S.A.E-3	Buda MU
A-stl	12¼		C-st	3	2½	2.25	3	4	In crk	H-gear	1200	Opt		1000		25¾	37¼	39¼	No	Yes	S.A.E-3	Buda YTU
A-stl	12¼		C-stl	3	2½	2.25	3	4	In crk	H-gear	1400-1600	Opt		1100		25¾	34½	37⅛	No	Yes	S.A.E-3	Buda ETU
A-stl	11¼		C-st	3	2	2.00	2¾	3½	In crk	H-gear	1400-1600	Opt		1100		25¾	34½	37⅛	No	Yes	S.A.E.3	Buda FTU
C-stl	13	8½	A-stl	3	2¼	2.25	3½	4½	In crk	H-gear	1400-1600	Opt		1150		25¾	32½	36½	No	Yes	S.A.E-3	Buda CTU
C-stl	13	8½	A-stl	3	2¼	2.25	3½	4½	In crk	H-gear	1100	Yes	Cent		1100	23	40	47½	Yes	No		Climax K
C-stl	14	11⅝	C-stl	3	2½	2.50	4½	4½	In crk	H-gear	1100	Yes	Cent		1150	24	40	50½	Yes	Yes	S.A.E-2	Climax KU
C-stl	10½	3½	C-stl	4	2¼	2.25	1⅞	2⅝	In crk	S-gear	900	Yes	Cent		1500	26	44	55⅜	Yes	Yes	S.A.E-1	Climax TU
	11		C-stl	3	2¼	2.21	3¾	4⅝	In crk	H-gear	2400	No			580	24½	30⅜	40¾	No	Yes	S.A.E-3	Continental 7R
C-stl	10¼		C-stl	3	2¼	2.21	3¾	4⅝	In crk	H-gear	1400	Opt			650	26¾	34⅝	40	No	Yes	S.A.E-2	Continental E4
C-stl	11		C-stl	3	2	2.21	3	4⅜	In crk	H-gear	1400	Opt			660	30	36¾	42½	No	Yes	S.A.E-2	Continental E7
C-stl	10⅛	51/32	C-stl	3	2⅜	2.21	3	4⅜	In crk	S-gear	1400	Opt			580	24½	31	38	No	Yes	Own	Continental C2
C-stl	10¼		C-stl	3	1⅞	2.21	2½	3⅞	In crk	H-gear	1600	Opt			560	26¾	33	36	No	Yes	S.A.E-2	Continental C4
C-stl	13¼		C-stl	3	2⅜	2.45	4	4	In crk	H-gear	2200	Opt		1300	475	23½	30⅞	34⅛	No	Yes	S.A.E-3	Continental N
C-stl	10¼	48¾	C-stl	3	3	2.05	2½	3.4	In crk	H-gear	1300	Yes	Cent	1100	1016	26¾	40¾	45¾	No	Yes	S.A.E-1	Continental B2
A-stl	12		A-stl	3	2½	2.50	2⅝	3⅝	In crk	H-gear	1800	No			600	23½	29⅝	42½	No	Yes	S.A.E-3	Continental 9N
C-stl	8½		C-stl	3	1⅞	1.84	1⅝	3	In crk	H-gear	1600	Yes			680	23½	38⅛	41⅝	Yes	Yes	Opt	Erd D
C-stl	10¼	32¼	C-stl	3	1⅞	2.25	2½	3	In crk	H-gear	2000	No			475	25¾	28⅜	38⅛	No	Yes	S.A.E-4	Falls X-9000
C-stl	7	16⅜	C-stl	3	1½	1.55	2¼	4	In crk	H-gear	2000	No	Cent	1100	425	25¾	33¼	34⅛	No	Yes	S.A.E-3	G. B. & S AA
	11	32¾	C-stl	3	2	.206	2½	3	In crk	S-gear	1600	No		900-1000	366	23½	24	33	No	Yes	S.A.E-5	G. B. & S SS
C-stl	11	32¾	C-stl	3	2	.206	2½	3	In crk	Sil-ch	2200	Opt			460	27⅝	32¾	33¼	Yes	Yes	S.A.E-3, 4	Gray-Beall K
C-stl	11	80⅜	C-stl	5	2	2.00	1½	3⅝	In crk	S-gear	2200	Opt			467	25¾	33⅝	32½	Yes	Yes	S.A.E-3, 4	Gray-Beall T
C-stl	11	80⅜	C-stl	5	2	2.00	1½	3⅝	In crk	H-gear	2000	Opt	Opt		750	25¾	35⅝	38⅜	Yes	Yes	S.A.E-3	Hercules CU2
C-stl	12	80⅜	C-stl	5	2	2.00	1½	3⅝	In crk	H-gear	1800	Opt	Opt	Opt	750	25¾	35⅝	38⅜	Yes	Yes	S.A.E-3	Hercules CU3
C-stl	12	80⅜	C-stl	5	2	2.00	1¾	4⅜	In crk	H-gear	1700	Opt	Opt	Opt	850	25¾	41	43⅝	Yes	Yes	S.A.E-2	Hercules MU2
C-stl	13¼	124	C-stl	5	2⅜	2.37	2½	4	In crk	H-gear	1600	Opt	Opt	Opt	850	25¾	41	43⅝	Yes	Yes	S.A.E-2	Hercules MU3
C-stl	13¼	124	C-stl	5	2⅝	2.37	2½	4	In crk	H-gear	1500	Opt	Opt	Opt	1000	28¾	41⅜	44⅜	Yes	Yes	S.A.E-1	Hercules TU
C-stl	11		C-stl	3	2	2.20	2⅝	4	In crk	H-gear	1500	Opt	Opt	Opt	1000	28¾	41⅜	44⅜	Yes	Yes	S.A.E-1	Hercules T3
C-stl	11		C-stl	3	2	2.00	4	4	In crk	H-gear	2150		Cent		575	25¼	30⅞	44		Yes	S.A.E-3	Herschell-Spillman 90
C-stl	11		C-stl	3	2	2.37	2⅝	4	In crk	H-gear	1900	Yes	Cent		440	25¼	31	35¾		Yes	SAE3-5	Herschell-Spillman 7000
C-stl	10¼	48⅛	C-stl	3	1⅞	2.22	2½	3	In crk	H-gear	2150		Cent		575	25¼	30⅞	44		Yes	S.A.E-3	Herschell-Spillman 11000
C-stl	11½		A-stl	3	2½	2.20	3	3	In crk	H-gear	2000	No			425				No	Yes	S.A.E-3	Highway AA
C-stl	11½		A-stl	3	2½	2.20	3	3	In crk	H-gear	1600	Yes	Cent	1750	734	25¼	36	37¼	No	Yes	S.A.E-3	Hinkley 300
C-stl	12		A-stl	3	2¼	2.33	3½	3½	In crk	H-gear	1600	Yes	Cent	1750	739	25¾	36	37¼	No	Yes	S.A.E-3	Hinkley 400
C-stl	12		A-stl	3	2¼	2.33	3½	3½	In crk	H-gear	1600	Yes	Cent	1650	884	25¾	40	43⅞	No	Yes	S.A.E-2	Hinkley 400
C-stl	12		A-stl	3	2¼	2.33	3½	3½	In crk	H-geer	1500	Yes	Cent	1550	896	25¾	40	43⅞	No	Yes	S.A.E-2	Hinkley 500
			C-stl	3		1.75	2¾	2¾	In crk	H-gear	1650	Yes	Cent	1450	988	25¾	41½	43⅞	No	Yes	S.A.E-2	Hinkley 200
C-stl	9½	16½	C-stl	2	2	2.06		3⅜	In crk	H-gear	2200	Opt	Cent							Opt		Hinkley 1600
C-stl	9¼	3.16	C-stl	3	1¾	2.00		3¼	In crk	H-gear	1800	No										Le Roi 2C
C-stl	37	2.03	C-stl	3	1¼	1.25		3¼	In crk	H-gear	2800	Yes	Cent		470	21⅝	26⅞	38¼	No	Yes	S.A.E-3	Lycoming K, KA, KB, KC
C-stl	12	8½	C-stl	3	3	3.00	2¾	3⅞	In crk	S-gear	2000	No			445	27	29⅝	34⅜	Yes	Yes	Opt	Matthews F
C-stl	13½	5½	C-stl	3	2½	2.50	2½	3⅝	In crk	H-gear	1500	No	Cent	1500	230				No	Yes	S.A.E-5	Matthews LM
C-stl	10		C-stl	2	2½	2.50		3⅝	In crk	H-gear	1600-1700	No	Cent	1500	1200	25¾	39⅞	47⅛	Yes	Yes	S.A.E-1, 2, 3	Midwest 400
C-stl	6½		C-stl	2	2¼	2.25		3⅝	In crk	H-gear	1800-2200	No	Cent	1500	900	25¾	37½	43⅞	Yes	Yes	S.A.E-2, 3	Midwest 402
C-stl	11		C-stl	3	2	2.18	2⅜	2⅝	In crk	H-gear	2200-2600	No	Cent	1500	600	25¾	35⅛	38⅝	Yes	Yes	S.A.E-2, 3	Midwest 408
C-stl	11		C-stl	3	2⅛	2.18	2⅞	3⅛	In crk	H-gear	1500	Yes	Suc	1500	425	25¾	33⅜	33½	No	Yes	S.A.E-3, 4	Midwest 409
C-stl	12		C-stl	3	2⅜	2.30	3⅝	3⅛	In crk	H-gear	1600	Yes	Cent	1500	600	24¾	34¾	44⅞	No	Yes		Northway 80
C-stl	9½		C-stl	3	2½	2.04	3	3⅛	In crk	H-gear	1500	Yes	Cent	1200	709	24¾	35¾	51⅛	No	Yes		Northway 84
C-stl	11	3	C-stl	3	1⅞	2.00	3	3¼	In crk	H-gear	2700	No			850	28¾	35⅞	25½	No	Yes		Northway 88
C-stl	11	2⅝	C-stl	3	1½	1.80	2	3	In crk	H-gear	2400	No			710	26⅜	30⅝	56¼	No	No		Northway 309
C-stl	18	26	C-stl	2	3	3.00		5	In crk	H-gear	2000	Yes	Cent	1400	710	27	30	40	No	Yes	S.A.E-3	Pittsburgh 92
C-stl	44		C-stl	2	2⅜	2.37		2⅜	In crk	S-gear	6000	Yes	Cent	600	370	23	28	30	No	No		Pittsburgh 93
C-stl	12	54⅜	C-stl	2	2¼	2.98		4⅛	In crk	S-gear	750	Yes	Cent		1150	32	26	46	Yes			Reliable T
C-stl	10	48	C-stl	3	2¼	2.25	2½	3½	In crk	Sil-ch	2500	No					25	54	Yes			Reliable 00
C-stl	9½	46	C-stl	3	2	2.00	2¾	3½	In crk	H-gear	2550	No		600	575	26	34¼	40½	No	Yes	S.A.E-3	Rochester G-1
C-stl	13¼		A-stl	3	2¾	2.87	3½	4½	In crk	H-gear	2400	No			254	29⅜	52-¼		No	Yes	S.A.E-3	Rochester 1000
C-stl	13¼		A-stl	3	2¾	2.87	3½	4½	In crk	H-gear	1400	Yes	Cent	800-900	545	26	26½	49¼	No	Yes	S.A.E-3	Rutenber 25
C-stl	13¼		A-stl	3	2¾	2.87	3½	4½	In crk	H-gear	1400	Yes	Cent	800-900	1150	24	42¾	49⅝				Stearns A
C-stl	13¼		A-stl	3	2¾	2.87	3½	4½	In crk	H-gear	1400	Yes	Cent	800-900	1150	24	42¾	49⅝	Yes	Yes	S.A.E-1	Stearns AU
C-stl	12½		A-stl	3	2½	2.50	3¼	4	In crk	H-gear	1400	Yes	Cent	800-900	1150	24	42¾	49⅝	Yes			Stearns B
C-stl	12½		A-stl	3	2½	2.50	3¼	4	In crk	H-gear	1500	Yes	Cent	800-900	1150	24	42¾	49⅝	Yes	Yes	S.A.E-2	Stearns BU
C-stl	12½		A-stl	3	2½	2.50	3¼	4	In crk	H-gear	1500	Yes	Cent	900-1000	850	23	38¾	46⅝	Yes			Stearns G
C-stl	12½		A-stl	3	2½	2.50	3¼	4	In crk	H-gear	1500	Yes	Cent	900-1000	850	23	38¾	46⅝	Yes	Yes	S.A.E-3	Stearns GU
C-stl	12½		A-stl	3	2½	2.50	3¼	4	In crk	H-gear	1500	Yes	Cent	900-1000	850	23	38¾	46⅝	Yes	Yes		Stearns H
C-stl	12½		A-stl	3	2½	2.50	3¼	4	In crk	H-gear	1500	Yes	Cent	900-1000	850	23	38¾	46⅝	Yes	Yes	S.A.E-2	Stearns HU
C-stl	12½		A-stl	3	2½	2.50	3¼	4	In crk	H-gear	1500	Yes	Cent	900-1000	850	23	38¾	46⅝	Yes	Yes		Stearns F
C-stl	10½		A-stl	4	2¼	2.25	1⅝	3½			2000	No							Yes	Yes	S.A.E-1	Stearns FU
C-stl	10	27	C-stl	3	2	2.00					2450	No			552	26	32	41¼	No	Yes	S.A.E-3	Sphinx A
C-stl	10	28	C-stl	3	2	2.00	2⅛	3⅜	In crk	H-gear	2400	Opt			430	25¾	32½	39	No	Yes	Opt	Supreme 5K
C-stl	10		C-stl	3	2	5.80	1¾	3¼	In crk	H-gear	2400	Yes			325	24	28	33¾	No	Yes	S.A.E-3	Supreme S4
C-stl	10		C-stl	2	2				In crk	H-gear	2200	Opt	Cent		300	24	27	28	No	Yes	S.A.E-3	Turmo O
C-stl	10		C-stl	3	2	2.00	1¾	3¼	In crk	H-gear	2100	Yes	Cent		460	24½	30	35	No	Yes	S.A.E-4	Turmo N
C-stl	12		C-stl	3	2	5.80	1¾	3¼	In crk	H-gear	2000	Yes	Cent		425	24	28	34	No	Yes	S.A.E-3	Turmo H
C-stl	14	15¾	C-stl	3	2⅜	7.70	2⅝	4	In crk	H-gear	1150	Yes	Cent	1000	1000	25¾	39½	44⅝	Yes	Opt	S.A.E-3	Turmo S
C-stl	20½	32	C-stl	3	3	9.00	4	5¾	In crk	H-gear	930	Yes	Cent	900	1750	29	50	55¾	Yes	No	S.A.E-2	Twin City TW
A-stl	13¼	8¾	A-stl	5	3	3.50	3⅝	6⅝	In crk	H-gear	600	Yes	Cent	535	4050	40⅝	66⅜	75¾	Yes	No		Twin City AE
A-stl	13¼	7⅝	A-stl	3	2⅜	7.37	4	4	In crk	H-gear	1400	Yes	Cent	1000	980	30½	40½	62	Yes	No		Twin City BE
A-stl	12¾	7¼	A-stl	3		7.37	3½	3½	In crk	H-gear	1500	Yes	Cent	1000	910	30½	40½	58	Yes	Yes	S.A.E-1, 2	Waukesha EU
A-stl	12¾	7¼	A-stl	3		7.37	3½	3½	In crk	H-gear	1500	Yes	Cent	1000	840	30½	38¾	55½	Yes	Yes	S.A.E-1, 2	Waukesha DU
A-stl	12½	7¼	A-stl	3		7.37	3½	3½	In crk	H-gear	1500	Yes	Cent	1000	825	30½	38¾	55½	Yes	Yes	S.A.E-1, 2	Waukesha CU
A-stl	10⅝	5⅝	C-stl	3		2.00	2½	2⅝	In crk	H-gear	1800	Yes	Cent	1000	615	20⅞	29	36¾	Yes	Yes	S.A.E-1, 2	Waukesha FU
A-stl	11	4½	A-stl	3	2	2.37	2½	4	In crk	H-gear	1800	Yes	Cent	1400	700	24⅜	31⅜	39⅞	Yes	No	S.A.E-2, 3	Waukesha BUX
A-stl	11	4½	A-stl	3	2	2.37	2½	4	In crk	H-gear	1400	Yes	Cent	1400	700	25¾	32½	40⅝	Yes	Yes	S.A.E-3	Weidely M
A-stl	11	4½	A-stl	3	2	2.37	2½	4	In crk	H-gear	1400	No			700	25¾	32½	40⅝		Yes	S.A.E-3	Weidely MAU
A-stl	11	4½	A-stl		2	2.37	2½	4	In crk	H-gear	2000	No			581	26	31⅞	37½	No	Yes	S.A.E-3	Weidely MAU2
A-stl	11	4½	A-stl	3	2	2.37	2½	4	In crk	H-gear	2000	No				26	31⅞	37½	No	Yes	S.A.E-3	Weidely MAT
	10			3	2	2.37	2¾	4	In crk	H-gear	2000	No				26	31⅞	40⅜	No	Yes	S.A.E-3	Weidely MAT
C-stl	10½	4⅝	A-stl	3	1¾	1.75	2¾	4	In crk	H-gear	2300	No			750	26	33⅞	51		Yes	S.A.E-3	Weidely MA
C-stl	10½	4⅝	A-stl	3	1¾	1.75	2¾	4	In crk	H-gear	1600	Opt		1000	450	21	31	35⅝	Yes	Yes	S.A.E-3	Weidely C
C-stl	12	5¾	A-stl	4	2	2.00	2½	3½	In crk	H-gear	1600	Opt		1000	460	21	31	35⅝	Yes	Yes	S.A.E-3	Wisconsin CAU
C-stl	12	5¾	A-stl	4	2	2.00	2½	3½	In crk	H-gear	1600	Opt		1000	650	21⅞	30½	44⅜	Yes	Yes	S.A.E-3	Wisconsin EAU
C-stl	12	5¾	A-stl	4	2	2.00	2½	3½	In crk	H-gear	1600	Opt		1000	660	21⅞	30½	44⅜	Yes	Yes	S.A.E-3	Wisconsin TAU
C-stl	12½	7⅞	A-stl	3	2¼	6.98	3¾	4	In crk	H-gear	1600	Opt		1000	680	21⅞	30½	44⅜	Yes	Yes	S.A.E-3	Wisconsin UAU
C-stl	12½	7⅞	A-stl	3	2¼	6.98	3¾	4	In crk	H-gear	1600	Opt		1000	790	24	31¾	46	Yes	Yes	S.A.E-3	Wisconsin VAU
C-stl	14	9⅜	A-stl	3	2⅜	2.37	4	6	In crk	H-gear	1600	Opt		1000	800	24	31¾	46	Yes	Yes	S.A.E-3	Wisconsin RAU
C-stl	14	9⅜	A-stl	4	2⅝	2.62	3-⅛	5¾	In crk	H-gear	1200	Opt		800	1040	23½	37⅛	48⅛	Yes	No		Wisconsin RBU
									In crk	H-gear	1200	Opt		800	1275	23½	37½	64⅛	Yes	No		Wisconsin M
																						Wisconsin P

Int—Integral
In Crk—In Crankcase
N-Steel—Nickel Steel

P-Steel—Pressed Steel
P, T—Pump, Thermosiphon
Pist—Piston

Sil-Ch—Silent Chain
S-Gear—Spur Gear
S-Steel—Semi-Steel

Spec-A—Special Alloy
Tung—Tungsten
Ther—Thermo-syphon

Ver—Vertical
V-Head—Valve-in-Head
V—Vee Type

Tendencies in British Passenger Car Design

(*Continued from page* 343)

Oil Pump Type

Gear	76 per cent
Plunger	19 per cent
Eccentric vane	3 per cent
Flywheel	1 per cent
Disk	1 per cent

Oil Pump Position

In sump	73 per cent
End of camshaft	21 per cent
Side of camshaft	6 per cent

Carbureter Make

Zenith	55 per cent
Own	14 per cent
Claudel	10 per cent
Smith, 5 jet	8 per cent
Cox	6 per cent
Solex	3 per cent
S. U.	2 per cent
W & P	1 per cent
Zephyr	1 per cent

Fuel Feed

Gravity	53 per cent
Vacuum	39 per cent
Pressure	8 per cent

Ignition

Magneto	86
Magneto and battery	6 } 92 per cent
Battery	8 per cent

Generator Drive

Belt	63 per cent
Positive	37 per cent

Electric Starter

Yes	84 per cent
No	8 per cent
Extra	5 per cent
Mechanical (seat lever)	3 per cent

Electric Equipment, Voltage

12	72 per cent
6	27 per cent
8	1 per cent

No. of Units

2	93 per cent
1	7 per cent

Crankshaft Bearings, Number

3	47 per cent
2	27 per cent
5	10.5 per cent
4	7.5 per cent
7	7 per cent
6	1 per cent

Type

Plain	92 per cent
Ball	3 per cent
Roller and plain	2 per cent
Ball and roller	1 per cent
Roller	1 per cent
Ball and plain	1 per cent

Camshaft Bearings, Number

3	44 per cent
2	26 per cent
4	22 per cent
7	5 per cent
5	3 per cent

Type

Bronze	50 per cent
White metal	32 per cent
Cast iron	7 per cent
Plain	4 per cent

(*Continued on page* 389)

Specifications of American

MAKE AND MODEL	Designed for Cars or Trucks	Load Capacity, Lbs. (Truck Axles)	Max. Drive Shaft Torque, Lb.-Ft.	Is Axle Trussed?	Type	Final Drive	GEAR RATIOS: Standard	GEAR RATIOS: Optional	Diameter of Axle Shafts	SPRING CENTERS: Maximum	SPRING CENTERS: Minimum	Torque Taken On	Provision for Radius Rods	Designed for Hotchkiss Drive?	Type of Differential
Clark B	Trucks	3500	520	No	½ Fl.	S-B.	6.28	5.50	2	39½	38	Sprgs.	No	Yes	B.
Clark C	Trucks	2700	520	No	½ Fl.	S-B.	5.66	5.10	2	40	38	Sprgs.	Yes	No	B.
Clark AH	Trucks	3000	455	No	F. Fl.	In-g.	5.53	.....	1⅛	39½	39	Sprgs.	No	Yes	B.
Clark AW	Trucks	3600	455	No	F. Fl.	In-g.	6.75	6.008	1⅛	40	39½	Sprgs.	No	Yes	B.
Clark 1D	Trucks	4200	540	No	F. Fl.	In-g.	7.00	7.60	1⅛	39	38	Sprgs.	No	Yes	B.
Clark 2D	Trucks	6500	830	No	F. Fl.	In-g.	8.00	.....	1½	39	38½	Sprgs.	No	Yes	B.
Clark 3D	Trucks	11000	1410	No	F. Fl.	.....	10.00	9.00	1½	42½	40	Sprgs.	No	Yes	B.
Clark 3H	Trucks	11000	1410	No	F. Fl.	In-g.	10.12	.....	1⅝	43½	.....	Sprgs.	Yes	Yes	B.
Clark 5D	Trucks	18000	1660	No	F. Fl.	In-g.	12.50	10.00	1½	42½	40	Sprgs.	No	Yes	B.
Columbia 10000	Cars	2400	360	No	¾ Fl.	S-B.	4.65	4.25	1¼	41	37	Sprgs.	No	Yes	B.
Columbia 50000	Cars	3600	615	No	¾ Fl.	S-B.	4.40	.....	1 11/16	41	37	Sprgs.*	No	Yes	B.
Columbia 51000	Trucks	3600	400	No	¾ Fl.	S-B.	.....	.....	1 11/16	41	37	Sprgs.	No	Yes	S.
Flint 2FA10	Cars	17000	1500	Yes	¾ Fl.	S-B.	4.90	4.00	1⅜	40	34	Sprgs.**	No	Yes	B.
Iron Mountain B1	Trucks	3500	378	No	½ Fl.	W.	6.20	7.75	.....	.....	.....	Sprgs.	Yes	Yes	B.
Iron Mountain B10	Trucks	4400	462	No	½ Fl.	W.	7.75	5.20	1.75	39½	38½	Sprgs.	No	.....	B.
Iron Mountain B15	Trucks	5800	573	No	½ Fl.	W.	7.75	8.75	2	39½	38	Sprgs.	No	.....	B.
Medway 30	Trucks	5600	550	No	F. Fl.	In-g.	6.80	5.90	.....	39	42	Sprgs.	No	.....	B, S-L.
National A	Cars	2800	225	No	½ Fl.	W.	4.75	4.25	1¾	43½	36	Sprgs.	Yes	Yes	B.
National 100	Trucks	3500	250	No	½ Fl.	W.	6.20	7.75	2⅛	40	34	Sprgs.	Yes	Yes	B.
Parker 2000	Trucks	.....	365	No	¾ Fl.	B.	5.77	5.20	1¾	40	37	Sprgs.	No	Yes	B.
Parker 21	Trucks	4000	365	No	¾ Fl.	In-g.	7.25	6.05	.....	39	37	Sprgs.	No	Yes	S-L.
Parker 30	Trucks	5000	408	No	.....	In-g.	7.25	6.05	.....	39	37	Sprgs.	No	Yes	S-L.
Parker 50	Trucks	7500	568	No	.....	In-g.	8.25	7.35	.....	40	38	Sprgs.	No	Yes	S-L.
Parker 70	Trucks	11000	662	No	.....	In-g.	10.50	9.20	.....	42	40	Sprgs.	No	Yes	S-L.
Parker 100	Trucks	15000	790	No	.....	In-g.	11.80	10.30	.....	42	40	Sprgs.	No	Yes	S-L.
Peru 3595	Cars	1200	100	Yes	F. Fl.	S-B.	4.75	4.75	.....	41	35	Opt.	No	Yes	B.
Peru 3600	Cars	2000	130	Yes	½ Fl.	S-B.	4.50	4.75	1½	41	35	Opt.	No	Yes	B.
Peru 3700	Cars	2000	130	No	½ Fl.	S-B.	4.50	4.25	1½	41	38	Sprgs.*	No	Yes	B.
Russell 30001	Trucks	4500	416	No	.....	In-g.	7.00	6.15	1⅛	.....	.....	Sprgs.	No	Yes	B.
Russell 45001	Trucks	6500	540	No	.....	In-g.	7.45	6.33	1⅛	.....	.....	Sprgs.	No	Yes	B.
Russell 60001	Trucks	8100	750	No	.....	In-g.	8.85	7.40	1¼	.....	.....	Sprgs.	No	Yes	B.
Salisbury A	Cars	2100	.....	Yes	¾ Fl.	S-B.	4.70	3.50	1¼	41⅜	36½	Sprgs.*	No	Yes	B.
Salisbury B	C. & T.	2700	.....	Yes	¾ Fl.	S-B.	4.50	4.00	1⅜	41¼	36½	Sprgs.	No	Yes	B.
Sheldon W500	Trucks	1800	.....	No	½ Fl.	W.	5.50	14.67	1⅜	35	42	Sprgs.	No	Yes	B.
Sheldon W1001	Trucks	2670	.....	No	½ Fl.	W.	5.20	5.75	1½	39	39¾	Sprgs.	No	Yes	B.
Sheldon W1501	Trucks	3650	.....	No	½ Fl.	W.	7.50	9.67	2 11/16	35	39	Sprgs.	No	Yes	B.
Sheldon W103	Trucks	5500	.....	No	½ Fl.	W.	7.75	5.50	2⅜	32	39	Sprgs.	No	Yes	B.
Sheldon W21	Trucks	6250	.....	No	½ Fl.	W.	7.75	4.50	2¾	32	39	Sprgs.	No	Yes	B.
Sheldon W31	Trucks	9560	.....	No	.....	.....	8.75	11.75	3⅜	36	44	Sprgs.	No	Yes	B.
Sheldon W32	Trucks	12500	.....	No	½ Fl.	W.	8.75	11.75	3⅜	36	44	Sprgs.	No	Yes	B.
Sheldon 51	Trucks	15000	.....	No	½ Fl.	W.	8.75	13.00	3¾	43	46	Sprgs.	No	Yes	B.
Stan-Par 2050	Cars	2000	.....	No	½ Fl.	B.	4.50	.....	1.37	42	38	Sprgs.	No	Yes	B.
Stan-Par 2550	Cars	2800	.....	No	½ Fl.	B.	4.50	.....	1.56	42	38	Sprgs.	No	Yes	B.
Stan-Par 3070R	C. & T.	3850	.....	No	½ Fl.	B.	4.00	.....	1.77	41	38	Sprgs.*	No	Yes	B.
Thomson A.W.M.	Trucks	4000	102	Yes	F. Fl.	W.	6.75	7.75	1.62	40	38	Sprgs.	No	Yes	B.
Thomson D.W.M.	Trucks	12000	200	Yes	F. Fl.	W.	10.33	12.00	2.19	43	39.5	Sprgs.	No	Yes	B.
Thomson B.W.M.	Trucks	8500	165	Yes	F. Fl.	W.	8.25	7.75	1.87	39¾	38¼	Sprgs.	No	Yes	B.
Timken 6250	Trucks	4000	.....	No	½ Fl.	W.	6.25	.....	2	39½	39½	Sprgs.	No	Yes	B.
Timken 6352	Trucks	4750	.....	No	½ Fl.	W.	7.20	6.20	2⅛	39½	37	Sprgs.	No	Yes	B.
Timken 6460	Trucks	6250	.....	No	½ Fl.	W.	7.10	7.75	2⅜	38½	39½	Sprgs.	No	Yes	B.
Timken 6560	Trucks	8750	.....	No	F. Fl.	W.	7.75	8.50	1⅝	39¾	37	Sprgs.	Yes	Yes	B.
Timken 6660	Trucks	12500	.....	No	F. Fl.	W.	10.33	8.75	2	45	42½	Sprgs.	Yes	Yes	B.
Timken 6760	Trucks	16750	.....	No	F. Fl.	W.	11.66	10.25	2⅝	46¾	42⅞	Sprgs.	Yes	Yes	B.
Timken 5000	Cars	.....	.....	No	½ Fl.	S-B.	5.10	5.50	.....	40	37	Opt.	No	Yes	B.
Timken 5112	Cars	.....	.....	No	½ Fl.	S-B.	4.66	4.40	.....	40¼	37	Opt.	No	Yes	B.
Timken 5302	Cars	.....	.....	No	½ Fl.	S-B.	4.44	4.90	.....	41	37	Sprgs.	No	Yes	B.
Timken 5762	Cars	.....	.....	No	F. Fl.	S-B.	4.54	4.98	.....	39½	39½	T.-Arm.	No	No	B.
Torbensen 750	Trucks	2700	405	No	F. Fl.	In-g.	6.33	5.33	1.57	40¼	37¼	Sprgs.	No	Yes	B.
Torbensen 1000	Trucks	4200	560	No	F. Fl.	In-g.	6.33	7.00	1.77	39¼	37½	Sprgs.	No	Yes	B.
Torbensen E1	Trucks	11000	1330	No	F. Fl.	In-g.	10.20	9.00	3½	44	39	Sprgs.	No	Yes	S-L.
Torbensen C	Trucks	7000	785	No	F. Fl.	In-g.	8.20	9.00	2.16	39	37¾	Sprgs.	No	Yes	B.
U. S. AA	Cars	2400	130	No	½ Fl.	S-B.	4.33	4.00	1⅝	30	41	Opt.	Yes	Yes	B, S-L.*
U. S. BB	Cars	2600	130	Yes	½ Fl.	S-B.	4.60	4.00	1⅝	30	.....	Opt.	Yes	Yes	B, S-L.
Vulcan 3R	Trucks	6000	550	No	F. Fl.	W.	7.75	7.00	1½	40½	37	Sprgs.	Yes	Yes	B.
Vulcan 4R	Trucks	9500	850	No	F. Fl.	W.	7.75	8.50	1¾	40½	37	Sprgs.	Yes	Yes	B.
Walker 2A	Trucks	7700	800	No	F. Fl.	In-g.	8.71	.....	1	39	38¼	Sprgs.	No	Yes	B.
Walker 25A	Trucks	10150	1100	No	F. Fl.	In-g.	8.49	.....	1¼	40¼	35¾	Sprgs.	No	Yes	B.
Walker 5A	Trucks	19350	1500	No	F. Fl.	In-g.	10.41	.....	1⅝	45½	39½	Sprgs.	No	Yes	B.
Walker 7A	Trucks	26250	1650	No	F. Fl.	In-g.	11.68	.....	1½	44¾	43½	Sprgs.	No	Yes	B.
Wisconsin 800G	Trucks	4000	.....	No	½ Fl.	W.	7.75	6.20	2⅜	40	38	Sprgs.	No	Yes	B.
Wisconsin 800H	Trucks	5500	.....	No	½ Fl.	W.	8.25	7.25	2⅝	40	38	Sprgs.	No	Yes	B.
Wisconsin 800J	Trucks	7300	.....	No	½ Fl.	W.	8.66	7.75	2⅝	40	38	Sprgs.	No	Yes	B.
Wisconsin 900C	Trucks	8800	.....	No	½ Fl.	W.	8.66	9.66	3	41	38½	Sprgs.	No	Yes	B.
Wisconsin 900D	Trucks	12000	.....	.....	½ Fl.	W.	10.00	9.00	3⅜	40	39	Sprgs.	No	Yes	B.
Wisconsin 900E	Trucks	1200	.....	No	½ Fl.	W.	10.00	9.00	3⅜	44½	42	Sprgs.	No	Yes	B.
Wisconsin 1000B	Trucks	16000	.....	No	½ Fl.	W.	11.75	.....	3¾	46	40¾	Sprgs.	No	Yes	B.
Wisconsin 60A	Trucks	7300	.....	No	½ Fl.	D-R.	.....	.....	2⅝	40	38	Sprgs.	No	.....	B.
Wisconsin 88C	Trucks	8800	.....	No	½ Fl.	D-R.	.....	.....	3	41	38½	Sprgs.	No	Yes	B.
Wisconsin 120K	Trucks	12000	.....	No	½ Fl.	D-R.	.....	.....	3⅜	50⅜	.....	T.-Arm.	Yes	.....	B.
Wisconsin 120B	Trucks	12000	.....	No	½ Fl.	D-R.	.....	.....	3⅜	40	39	.....	.....	Yes	B.

ABBREVIATIONS

A Steel—Alloy Steel
Bl—Ball
B—Bevel
Br—Bronze
Br & St—Bronze and Steel
C-S—Carbon Steel
C-N—Chrome Nickel
C-Van—Chrome Vanadium
D R—Double Reduction
E-S—Electric Steel
F Fl—Full Floating
In G—Internal Gear
M-I—Malleable Iron
Man Br—Manganese Bronze
M-S—Molybdenum Steel
N-A—Nickel Alloy

Stock Axles for 1922

SERVICE BRAKES			EMERGENCY BRAKES			TYPE OF BEARINGS									
Type of Brake	Diameter of Drum	Width of Drum	Type of Brake	Diameter of Drum	Width of Drum	At Differential	At Wheels	On Pinion Shaft	Wheel Tread	Weight of Axle (Complete Without Wheels)	Housing Material	Shaft Material	Gear Material	MAKE AND MODEL	
Ext..	16	2½	Int..	15⅝	1½	R....	R. or Bl	Bl....	56	480	S-C...	N-S.....	N-S.....	Clark	B
Ext..	16	2	Int..	15⅝	1½	R	R.or Bl.	Bl....	56	325	S-P...	N-S.....	N-S.....	Clark	C
Ext..	14	2	.....	.....	...	R. or Bl.	R. or Bl.	R, Bl...	56	435	M-I...	N-S.....	C-S., N-S..	Clark	AH
Ext..	14	2	.....	.....	...	R....	R. or Bl.	R, Bl...	56	375	M-I...	N-S.....	C-S., N-S..	Clark	AW
Ext..	16	2½	Int..	15⅝	1½	R. or Bl.	R. or Bl.	R, Bl...	56	505	S-C...	N-S.....	C-S., N-S..	Clark	1D
Ext..	16½	.....	Int..	15	2½	R.....	R. or Bl.	R, Bl...	58	750	S-C...	N-S.....	C-S., N-S..	Clark	2D
Ext..	20	3	Int..	19¼	2½	R.....	R. or Bl.	R, Bl...	70	953	S-C...	N-S.....	N-S.....	Clark	3D
Ext..	9	4½	Int..	19¼	2½	R.....	R, Bl..	R, Bl...	65	810	.....	N-S.....	N-S.....	Clark	3H
Int...	22¼	3	.....	.....	...	R.....	R, Bl..	R, Bl...	67	1280	S-C...	N-S.....	N-S.....	Clark	5D
Ext..	12⅝	2½	Int..	12⅝	2½	R.....	B.....	R.....	56	230	P-S...	S.A.E. 2340.	S.A.E. 1020.	Columbia	10000
Ext..	16	3	Int..	16	3	R.....	R.....	R.....	56	320	P-S...	S.A.E. 2340.	S.A.E. 2320.	Columbia	50000
Ext..	16	3	Int..	16	3	R.....	R.....	R.....	56	335	P-S...	S.A.E. 2340.	S.A.E. 2320.	Columbia	51000
Ext..	12	2½	Int..	12	2½	R, Bl..	R.....	Bl.....	56	210	M-I...	N-S.....	N-S.....	Flint	2FA10
Int....	13⅝	1¾	Int..	13⅝	1¾	Bl....	Bl.....	Bl.....	56	450	M-I...	S.A.E. 3135.	S.A.E. 3120.	Iron Mountain	B1
Int...	15⅝	2	Int..	15⅝	1¾	Bl....	Bl.....	Bl.....	56	500	M-I...	S.A.E. 3135.	S.A.E. 3120.	Iron Mountain	B10
Int...	15⅝	2	Int..	15⅝	1¾	Bl....	Bl.....	Bl.....	58	525	E-S...	S.A.E. 3135.	S.A.E. 3120.	Iron Mountain	B15
Ext..	7	4	.....	.....	...	R.....	R, Bl...	Bl.....	56½	330	S-C...	N-S.....	N-S.....	Medway	30
Int....	14	4⅜	Int..	14	4⅜	R.....	R.....	R.....	56	340	P-S...	S.A.E. 3145.	S.A.E. 3135.	National	A
Int...	14	4⅜	Int..	14	4⅜	R.....	R.....	R.....	56	395	M-I...	S.A.E. 3145.	S.A.E. 3135.	National	100
.....	.....	.....	Ext..	.....	...	Bl....	Bl.....	Bl.....	.....	.....	P-S...	Nickel.....	N-S.....	Parker	2000
.....	.....	.....	.....	.....	...	Bl....	Bl, R...	Bl.....	56	400	M-I...	Nickel.....	N-S.....	Parker	21
.....	.....	.....	.....	.....	...	Bl....	Bl, R...	Bl.....	56	425	M-I...	Nickel.....	N-S.....	Parker	30
.....	.....	.....	.....	.....	...	Bl....	Bl, R...	Bl.....	60½	625	M-I...	Nickel.....	N-S.....	Parker	50
.....	.....	.....	.....	.....	...	Bl....	Bl, R...	Bl.....	66	950	M-I...	Nickel.....	N-S.....	Parker	70
.....	.....	.....	.....	.....	...	Bl....	Bl, R...	Bl.....	66	1200	M-I...	Nickel.....	N-S.....	Parker	100
Ext..	12	1¾	Int..	12	1¾	R.....	R.....	Bl.....	56	185	M-I...	A-S.....	A-S.....	Peru	3595
Ext..	14	1¾	Int..	14	1¾	R.....	R.....	R.....	56	200	M-I...	A-S.....	A-S.....	Peru	3600
Ext..	14	1¾	Int..	14	1¾	R.....	R.....	R.....	56	200	Steel..	A-S.....	A-S.....	Peru	3700
Ext..	14	.....	Int..	.....	...	R, Bl..	R.....	Bl.....	.....	.....	M-I...	N-S.....	N-S.....	Russell	30001
Ext..	15½	.....	Int..	15	...	R, Bl..	R.....	Bl.....	.....	575	M-I...	N-S.....	N-S.....	Russell	45001
Ext..	16½	.....	Int..	16	...	R, Bl..	R.....	Bl.....	.....	656	Nickel	N-S.....	N-S.....	Russell	60001
Ext..	14⅜	2¾	Int..	14	2¾	R.....	Bl.....	R, Bl..	56	289	P-S...	C-N.....	N-S.....	Salisbury	A
Ext..	16⅜	2¾	Int..	16	2¾	R.....	R.....	R, Bl..	56	360	P-S...	C-N.....	N-S.....	Salisbury	B
Int...	12	4	Int..	12	4	Bl....	R.....	Bl.....	56	268	M-I...	S.A.E. 2340.	Br.....	Sheldon	W500
Int....	14	5	Int..	14	5	Bl....	R.....	Bl.....	56	460	M-I...	S.A.E. 2340.	Br.....	Sheldon	W1001
Int...	16	5½	Int..	16	5½	Bl....	R.....	Bl.....	57	621	M-I...	S.A.E. 2340.	Br.....	Sheldon	W1501
Int...	18	6	Int..	18	6	Bl....	R.....	Bl.....	59½	813	M-I...	S.A.E. 2340.	Br.....	Sheldon	W103
Int...	18	6	Int..	18	6	Bl....	R.....	Bl.....	58	941	M-I...	S.A.E. 2340.	Br.....	Sheldon	W21
Int...	20	8⅛	Int..	20	8⅛	Bl....	R.....	Bl.....	69¾	1436	Steel..	S.A.E. 2340.	Br.....	Sheldon	W31
Int...	20	8⅛	Int..	20	8⅛	Bl....	R.....	Bl.....	69¾	1436	Steel..	M-S.....	Br.....	Sheldon	W32
Int...	24	8¾	Int..	24	8¾	Bl....	R.....	Bl.....	70¾	2464	Steel..	S.A.E. 2340.	Br.....	Sheldon	51
Ext..	12⅜	1¾	Int..	12	1¾	R.....	R.....	R.....	56	245	P-S...	S.A.E. 2335.	S.A.E. 2315.	Stan-Par	2050
Ext..	14	2	Int..	13⅝	2	R.....	R.....	R.....	56	290	P-S...	S.A.E. 2335.	S.A.E. 2315.	Stan-Par	2550
Ext..	16	2¼	Int..	15⅝	2¼	R.....	R.....	R.....	56	375	P-S...	S.A.E. 2335.	S.A.E. 2315.	Stan-Par	3070R
Int...	18	4⅞	Int..	18	4⅞	B.....	B.....	B.....	56	610	M-I...	C-N.....	Man-Br....	Thomson	A.W.M.
Int....	20	7.06	Int..	20	7⅛	B.....	B.....	B.....	68	1434	C-S...	C-N.....	Man-Br....	Thomson	D.W.M.
Int...	18	6	Int..	18	6	B.....	B.....	B.....	59½	821	M-I...	C-N.....	Man-Br....	Thomson	B.W.M.
Int...	15	2½	Int..	15	2½	R.....	R.....	R.....	56	375	P-S...	C-N.....	Br. & St....	Timken	6250
Int...	15	3	Int..	15	3	R.....	R.....	R.....	56	475	P-S...	C-N.....	Br. & St....	Timken	6352
Int...	16	3¼	Int..	16	3¼	R.....	R.....	R.....	58	650	P-S...	C-N.....	Br. & St....	Timken	6460
Int...	18	3½	Int..	18	3½	R.....	R.....	R.....	58½	850	P-S...	C-N.....	Br. & St....	Timken	6560
Int...	21	3¾	Int..	21	3¾	R.....	R.....	R.....	65¾	1280	P-S...	C-N.....	Br. & St....	Timken	6660
Int...	24	4	Int..	24	4	R.....	R.....	R.....	69½	1750	P-S...	C-N.....	Br. & St....	Timken	6760
Ext..	12	1¾	.....	.....	...	R.....	R.....	R.....	56	220	P-S...	C-N.....	C-Van.....	Timken	5000
Ext..	14⅜	1¾	Int..	14	1½	R.....	R.....	R.....	56	265	P-S...	C-N.....	C-Van.....	Timken	5112
Ext..	5½	2½	Int..	14½	2½	R.....	R.....	R.....	56	325	P-S...	C-N.....	C-Van.....	Timken	5302
Ext..	16	2½	Int..	15⅝	2½	R.....	R.....	R.....	56	400	P-S...	C-N.....	C-Van.....	Timken	5762
Ext..	14	2	Int..	13⅝	2	R.....	R.....	R.....	56	270	.....	N-S.....	.....	Torbensen	750
Ext..	15	2½	Int..	...	2¼	R.....	R.....	R.....	56	370	.....	S.A.E. 3140.	N-S.....	Torbensen	1000
Int...	19	3½	Ext..	10	4½	R.....	R.....	R.....	67½	1100	.....	N-S.....	S.A.E. 1050.	Torbensen	E1
Ext..	18	2½	Int..	17⅜	2¼	R.....	R.....	R.....	56	540	.....	S.A.E. 3140.	N-S.....	Torbensen	C
Int...	14	4	Int..	14	...	R.....	Bl.....	R.....	56	240	S. & A.	M-S.....	N-A.....	U. S.	AA
.....	.....	.....	Int..	14	2¾	R.....	R.....	R.....	56	240	N-A..	M-S.....	N-A.....	U. S.	BB
Int...	18	6	Int..	18	6	R.....	R.....	Bl.....	58	700	Steel..	C-N.....	.....	Vulcan	3R
Int...	20	6	Int..	20	6	R.....	R.....	Bl.....	58½	875	Steel..	C-N.....	.....	Vulcan	4R
Ext..	8	4½	Int..	18½	3⅜	Bl....	Bl.....	R.....	56	420	C-S...	S.A.E. 3135.	S.A.E. 2320.	Walker	2A
Ext..	8	4½	Int..	19½	3⅜	Bl....	Bl.....	R.....	....	615	C-S...	S.A.E. 3135.	S.A.E. 2320.	Walker	25A
Ext..	12	6	Int..	20	4⅝	Bl....	Bl.....	R.....	63½	835	C-S...	S.A.E. 3135.	S.A.E. 2320.	Walker	5A
Ext..	12	6	Int..	24	5⅝	Bl....	Bl.....	R.....	69½	1000	C-S...	S.A.E. 3135.	S.A.E. 2320.	Walker	7A
Int...	17	2½	Int..	12¼	2½	Bl....	.....	Bl.....	57½	550	.....	S.A.E. 3140.	.....	Wisconsin	800G
Int...	17	2½	Int..	12¼	2½	Bl....	.....	Bl.....	57½	640	.....	S.A.E. 3140.	.....	Wisconsin	800H
Int...	17	2½	Int..	12¼	2½	Bl....	.....	Bl.....	58	700	.....	S.A.E. 3140.	.....	Wisconsin	800J
Int...	20	2½	Int..	15½	2½	Bl....	.....	Bl.....	59½	875	.....	S.A.E. 3140.	.....	Wisconsin	900C
Int...	20	2½	Int..	15½	2½	Bl....	.....	Bl.....	60	975	.....	S.A.E. 3140.	.....	Wisconsin	900D
Int...	20	2½	Int..	15½	2½	Bl....	.....	Bl.....	64	1000	.....	S.A.E. 3140.	.....	Wisconsin	900E
Int...	24	3½	Int..	18½	3½	Bl....	.....	Bl.....	70	1590	.....	S.A.E. 3140.	.....	Wisconsin	1000B
Int...	17	2½	Int..	12¼	2½	Bl....	.....	Bl.....	87½	690	.....	S.A.E. 3140.	S.A.E. 2315.	Wisconsin	60A
Int...	20	2½	Int..	15½	2½	Bl....	.....	Bl.....	59½	870	.....	S.A.E. 3140.	S.A.E. 2315.	Wisconsin	88C
Int...	20	2½	Int..	15½	2½	Bl....	.....	Bl.....	72¾	....	.....	S.A.E. 3140.	S.A.E. 2315.	Wisconsin	120K
Int...	20	2½	Int..	15½	2½	Bl....	.....	Bl.....	60	970	.....	S.A.E. 3140.	S.A.E. 2315.	Wisconsin	120B

N-S—Nickel Steel
P-S—Pressed Steel
R—Roller
½ Fl—Semi-Floating
S B—Spiral Bevel
S L—Self Locking
S-C—Steel Casting
S-P—Steel Pressing
S—Spur
S & A—Steel and Aluminum
Taper R—Taper Roller
¾ Fl—Three Quarter Floating
T-Arm—Torque Arm
W—Worm
*—With Torque Arm
**—On Torque Tube

Tendencies in British Passenger Car Design

(*Continued from page* 388)

Ball ..... 4 per cent
Ball and bronze..... 1 per cent
1 ball, 3 plain..... 1 per cent
Ball and plain..... 1 per cent

Gearset Bearings

Mainshaft, Type

Ball .....87 per cent
Roller ..... 8 per cent
Ball and roller..... 3 per cent
Ball and plain..... 1 per cent
Plain ..... 1 per cent

Layshaft, Type

Ball .....80 per cent
Plain .....12 per cent
Roller ..... 6 per cent
Ball and roller..... 1 per cent
Ball and plain..... 1 per cent

Pilot

Plain .....60 per cent
Ball .....31 per cent
Roller ..... 9 per cent

Wheel Bearings

Front

Ball .....63 per cent
Roller ..... 28 per cent
Ball and roller..... 7 per cent
Ball and plain..... 2 per cent

Rear

Ball .....76 per cent
Roller .....18 per cent
Ball and roller..... 4 per cent
Ball and plain..... 2 per cent

Differential Bearings

Ball .....86 per cent
Roller .....14 per cent

Clutch

Type

Dry single plate .....34 per cent
Cone .....29 per cent
Inverted cone .....23 per cent
Multi-plate in oil..... 7 per cent
Dry multi-plate ..... 6 per cent
Single plate in oil..... 1 per cent

Clutch Friction Material

Fabric facing .....76 per cent
Leather facing .....10 per cent
Metal to metal (plate clutches) 9 per cent
Metal facing (cone clutches). 2 per cent
Cork inserts ..... 2 per cent
Wood facing ..... 1 per cent

Clutch Shaft Joints

Front

Fabric disk .....44 per cent
Steel disk .....17 per cent
Miscellaneous .....39 per cent

Rear

Fabric disk .....42 per cent
Leather disk .....12 per cent
Steel disk .....12 per cent
Star ..... 10 per cent
Pot .....10 per cent
Miscellaneous .....14 per cent

Gearset Location

Amidships .....55 per cent
Unit engine .....28 per cent
Unit propeller shaft .....9.5 per cent
Unit axle .....7.5 per cent

Number of Speeds

3 .....54 per cent
4 .....46 per cent

Specifications of American Stock Gearsets for 1922

NAME AND MODEL	Designed for	Max. Engine Torque	Type	BEARINGS: Main Shaft	BEARINGS: Secondary Shaft	No. of Speeds	WIDTH OF GEAR FACES: Const. Mesh Set	WIDTH OF GEAR FACES: 1st Inter.	WIDTH OF GEAR FACES: 2nd Inter.	WIDTH OF GEAR FACES: Low	WIDTH OF GEAR FACES: Reverse	Housing Material	Shaft Material	Gear Material	Gear Teeth Pitch	GEAR RATIOS: First	GEAR RATIOS: Second	GEAR RATIOS: Third	GEAR RATIOS: Fourth	GEAR RATIOS: Reverse	Gear Location	Control Location	Sold with Clutch	Weight	NAME AND MODEL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Ball BG1-2	C,Tr,T	...	Ind. Cl.	B	B	3	5/8	5/8	5/8	5/8	5/8	C.I.	Nic-Van	3½ Nickel	6-	2.98	1.89	1.00	....	3.64	On Eng.	C	Opt	.....	Ball BG1-2
Ball BG3-4	C,Tr,T	...	Ind. Cl.	B	B	3	7/8	7/8	7/8	7/8	7/8	C.I.	Nic-Van	3½ Nickel	6-	3.00	1.70	1.00	....	3.50	On Eng.	C	Opt	.....	Ball BG3-4
Brown Lipe 20	C	83½	Clash	B	P	3	5/8	5/8	5/8	5/8	5/8	I. & Al.	Chrome-S	S.A.E. 2320	6-8	3.34	1.66	1.00	....	4.17	On Eng.	C	Opt	102- 86	Brown Lipe 20
Brown Lipe 25	C	108½	Clash	B	P	3	5/8	5/8	...	5/8	5/8	I. & Al.	Chrome-S	S.A.E. 2320	6-8	3.33	1.68	1.00	....	4.35	On Eng.	C	Opt	89	Brown Lipe 25
Brown Lipe 30	C,T	133½	Clash	R	B	3	5/8	3/4	3/4	3/4	3/4	I. & Al.	Chrome-S	S.A.E. 2320	6-8	3.33	1.68	1.00	....	4.35	On Eng.	C	Opt	95-142	Brown Lipe 30
Brown Lipe 35-3	C	183½	Clash	R	R	3	5/8	3/4	3/4	3/4	3/4	I. & Al.	Chrome-S	S.A.E. 2320	6-8	3.36	1.76	1.00	....	4.32	On Eng.	C	Opt	95-142	Brown Lipe 35-3
Brown Lipe 35-3	T	183½	Clash	R	R	3	5/8	3/4	3/4	3/4	3/4	I.	Chrome-S	S.A.E. 2320	6-8	4.00	1.76	1.00	....	4.92	A	C	Opt	100	Brown Lipe 35-3
Brown Lipe 35-4	C	183½	Clash	R	R	4	5/8	3/4	3/4	3/4	3/4	I. & Al.	Chrome-S	S.A.E. 2320	6-8	5.35	2.84	1.76	1.00	6.43	On Eng.	C	Opt	150-198	Brown Lipe 35-4
Brown Lipe 35-4	T	183½	Clash	R	R	4	5/8	3/4	3/4	3/4	3/4	I. & Al.	Chrome-S	S.A.E. 2320	6-8	5.35	2.84	1.76	1.00	6.25	A	C	Opt	120	Brown Lipe 35-4
Brown Lipe 50-4	C,T	183½	Clash	R	R	4	7/8	7/8	7/8	7/8	3/4	I. & Al.	Chrome-S	S.A.E. 2320	6-8	5.35	2.84	1.76	5.35	6.43	On Eng.	C	Opt	147-211	Brown Lipe 50-4
Brown Lipe 50-4		183½	Clash	R	R	4	7/8	1	1	1	1	I.	Chrome-S	S.A.E. 2320	6-8	5.35	2.84	1.76	1.00	6.25	A	C	Opt	130	Brown Lipe 50-4
Brown Lipe 51-4	T	250	Clash	R	R	4	7/8	1	1	1½	...	G.I.	Chrome-S	S.A.E. 2320	6-8	5.35	....	....	....	....	A	C	Opt	.....	Brown Lipe 51-4
Brown Lipe 55-4		250	Clash	R	R	4	7/8	1	1⅛	1⅜	1⅛	G.I.	Chrome-S	S.A.E. 2320	5-7	5.35	2.84	1.76	1.00	6.30	A	C	Opt	.....	Brown Lipe 55-4
Brown Lipe 60-4	T	275	Clash	R	R	4	1¼	1½	1½	1½	1⅜	I.	Chrome-S	S.A.E. 2320	5-7	5.35	2.84	1.76	1.00	6.43	A	C	Opt	235	Brown Lipe 60-4
Cotta 5S	T	...	Ind. Cl.	B	B	3	1¼	1¼	...	1¼	1¼	S.S.	S.A.E. 2335	S.A.E. 2320	5-6	4.51	1.81	1.00	....	6.00	A	C	No	.....	Cotta 5S
Cotta 12-3	T & Tr	...	Ind. Cl.	B	B	3	1½	1½	...	1½	1½	S.S.	S.A.E. 2335	S.A.E. 2320	4½-5½	4.51	1.81	1.00	....	6.00	A	C	No	.....	Cotta 12-3
Covert MUC	C,T	118	Ind. Cl.	B	B	3	15/16	15/16	...	15/16	15/16	C.I.	S.A.E. 2320	S.A.E. 2320	6-8	3.62	1.91	1.00	....	4.46	On Eng.	C	Yes	.....	Covert MUC
Covert SA	T	184	Ind. Cl.	B. & R.	R	4	1⅛	1¼	1⅛	1⅛	1⅛	C.I.	S.A.E. 2320	S.A.E. 2320	5-7	5.07	3.04	1.63	1.00	6.76	A	.....	No	.....	Covert SA
Covert RAK4	T	147	Clash	B	B	4	7/8	1	1	1¼	1	C.I.	S.A.E. 2320	S.A.E. 2320	6-8	4.76	2.70	1.60	1.00	5.95	A	.....	No	.....	Covert RAK4
Covert RU4-C	T	147	Ind. Cl.	B	B	4	15/16	1	15/16	1¼	1	C.I.	S.A.E. 2320	S.A.E. 2320	6-8	4.76	2.70	1.60	1.00	5.95	On Eng.	C	Yes	.....	Covert RU4 C
Covert RA3	T	141	Ind. Cl.	B	B	3	7/8	1	...	1	15/16	C.I.	S.A.E. 2320	S.A.E. 2320	6-8	3.67	1.60	1.00	....	....	A	.....	No	.....	Covert RA3
Covert RUC3	C,T	141	Clash	B	B	3	7/8	1	...	1	15/16	C.I.	S.A.E. 2320	S.A.E. 2320	6-8	3.67	1.60	1.00	....	....	On Eng.	C	Yes	.....	Covert RUC3
Covert L	C	83	Ind. Cl.	B. & R.	R	3	5/8	15/16	...	15/16	15/16	C.I.	S.A.E. 2320	S.A.E. 2320	7-9	3.61	1.82	1.00	....	4.50	On Eng.	C	No	.....	Covert L
Detroit CY	C,T	200	Clash	B	B	3	3/4	7/8	...	7/8	7/8	G. I. & Al.	Nic-Steel	Nic-Steel	6-8	3.20	1.72	....	....	3.88	On Eng.	C	Opt	120-90	Detroit CY
Detroit H	T	...	Clash	B	B	4	7/8	1	1	1	1	C.I.	Nic-Steel	Nic-Steel	6-8	4.40	3.08	1.76	....	5.28	A	.....	No	160	Detroit H
Detroit Dy	C,T	140	Clash	B	R	3	3/4	3/4	...	3/4	3/4	G. I. & Al.	Nic-Steel	Nic-Steel	7-9	3.20	1.72	....	....	3.88	On Eng.	C	Opt	95- 70	Detroit Dy
Dundore N35	C,T	...	Clash	B	B	3	15/16	3/4	...	15/16	15/16	S.S.	S.A.E. 2345	S.A.E. 2320	6-8	3.07	1.76	....	....	4.00	On Eng.	C	No	85-120	Dundore N35
Dundore F50	T	...	Clash	B	B	3	7/8	1	...	1	1	S.S.	S.A.E. 2345	S.A.E. 2320	6-8	3.36	1.90	....	....	4.32	On Eng.	C	No	155	Dundore F50
Dundore K	C	...	Clash	B	B	4	3/4	3/4	3/4	3/4	3/4	Al	S.A.E. 5140	S.A.E. 5165	6-8	2.69	1.56	....	.73	3.46	A	.....	No	105	Dundore K
Dundore R	C	...	Clash	B	B	4	3/4	3/4	3/4	3/4	3/4	Al	S.A.E. 5140	S.A.E. 5165	6-8	2.69	1.56	....	.73	3.46	On Eng.	C	No	120	Dundore R
Durston 02500B	C,T	120	Clash	B	P	3	5/8	5/8	...	1	1	C.I.	Chrome-N	3½ Nic Steel	6-8	3.09	1.85	1.00	....	3.87	On Eng.	C	No	95	Durston 02500B
Fuller H	T,Tr	...	Clash	B	B	4	...	...	...	...	...	C.I.	3½ Nickel	3½ Nickel	6-8	6.30	3.20	1.70	1.00	6.30	A	C	Yes	.....	Fuller H
Fuller LTU4-5	C,T	...	Clash	B	B	3	7/8	7/8	7/8	7/8	7/8	C.I.	3½ Nickel	3½ Nickel	6-8	4.00	1.70	1.00	....	3.50	On Eng.	C	Yes	.....	Fuller LTU4-5
Fuller GU7-U8-7	C,T,Tr	...	Clash	B	B	4	7/8	1	1	1	1	C.I.	3½ Nickel	3½ Nickel	6-8	4.80	3.00	1.60	1.00	6.50	On Eng.	C	Yes	.....	Fuller GU7-U8-7
Fuller TU3-4-TU3	C,T	...	Clash	B	B	3	7/8	15/16	7/8	...	7/8	C.I.	3½ Nickel	3½ Nickel	6-8	3.00	1.70	1.00	....	3.50	On Eng.	C	Yes	150	Fuller TU3-4-TU3
Grant Lees K	C,T	140	Clash	B	P	3	5/8	5/8	...	5/8	5/8	C.I.	S.A.E. 2320	S.A.E. 2320	7-9	3.00	1.90	1.00	....	3.60	On Eng.	C	No	85	Grant Lees K
Grant Lees 515	C,T	200	Clash	B	B	3	15/16	3/4	...	3/4	3/4	C.I.	S.A.E. 2320	S.A.E. 2320	6-8	2.90	1.70	1.00	....	3.80	On Eng.	C	No	105	Grant Lees 515
Mech. Mach. MU	C	100	Clash	B	P	3	5/8	..	5/8	5/8	5/8	G.I.	S.A.E. 2340	S.A.E. 2340	7-9	3.04	1.75	1.00	....	3.99	On Eng.	C	No	75	Mech. Mach. MU
Mech. Mach. LU	C	150	Clash	B	P	3	15/16	3/4	...	3/4	3/4	G.I.	S.A.E. 2340	S.A.E. 2340	7-9	3.24	1.66	1.00	....	4.16	On Eng.	C	No	92	Mech. Mach. LU
Muncie T25	C	110	Clash	B	B, P	3	5/8	...	15/16	15/16	15/16	C.I.	3½ Nickel	S.A.E. 3120	6-8	2.60	1.70	1.00	....	3.40	On Eng.	C	No	90	Muncie T25
Muncie T23	C,T	180	Clash	B	B	3	3/4	...	29/32	15/16	15/16	C.I.	S.A.E. 2320	S.A.E. 3120	6-8	3.00	1.82	1.00	....	3.90	On Eng.	C	Opt	117½	Muncie T23
Pittsburgh 35T	T	80	Ind. Cl.	B. & R.	P	3	3/4	3/4	...	3/4	3/4	C.I.	3½ Nickel	3½ Nickel	7-9	1.00	1.76	3.36	....	4.33	On Eng.	C	Opt	120	Pittsburgh 35T
Warner Gear T38B	C	200	Clash	B	R	3	3/4	3/4	...	3/4	3/4	G. I., Al.	S.A.E. 1045	S.A.E. 2345	6-8	3.04	1.81	1.10	....	3.70	On Eng.	C	Yes	.....	Warner Gear T38B
Warner Gear T38C	T	130	Clash	B	R	3	3/4	3/4	...	3/4	3/4	G.I.	S.A.E. 1045	S.A.E. 2345	6-8	4.84	2.39	1.00	....	6.05	On Eng.	C	Yes	.....	Warner Gear T38C
Warner Gear T60	C	150	Clash	B	R	3	5/8	3/4	...	3/4	3/4	G. I., Al.	S.A.E. 1045	S.A.E. 2345	6-8	3.24	1.63	1.00	....	4.05	On Eng.	C	Opt	95	Warner Gear T60
Warner Gear T53	T	220	Clash	B	B	4	1	1¼	1¼	1⅜	1¼	C.I.	S.A.E. 2320	S.A.E. 2345	5-7	4.99	3.16	1.79	1.00	5.78	A	.....	No	.....	Warner Gear T53
Warner Gear T62	T	275	Clash	B	B	4	1¼	1⅜	1⅜	1½	1½	C.I.	S.A.E. 2320	S.A.E. 2345	5-7	5.84	3.22	1.75	1.00	6.74	A	.....	No	.....	Warner Gear T62
Warren A	C,T	...	Clash	B	B	3	5/8	3/4	...	3/4	3/4	C.I.	S.A.E. 3120	S.A.E. 2320	6-8	3.52	1.70	1.00	....	4.40	On Eng.	C	No	110	Warren A
Warren B	C,T	...	Clash	B	P	3	5/8	5/8	...	5/8	5/8	C.I.	S.A.E. 3120	S.A.E. 2320	7-9	2.98	1.73	1.00	....	3.62	On Eng.	C	No	90	Warren B
Warren C	C,T	...	Clash	B	B	3	5/8	3/4	...	3/4	3/4	C.I.	S.A.E. 3120	S.A.E. 2320	6-8	4.01	1.98	1.00	....	5.01	On Eng.	C	No	120	Warren C

ABBREVIATIONS:

Column 1:
C—Cars
T—Trucks
Tr—Tractors

Column 4:
B—Ball
R—Roller

Column 8:
Ind. Cl—Individual Clutch

Column 5:
B—Ball
P—Plain
R—Roller

Column 12:
Al—Aluminum
C-I—Cast Iron
G-I—Gray Iron
I & Al—Iron and Aluminum
S-S—Semi-Steel

Columns 13 & 14:
Chrome-N—Chrome Nickel
Chrome-S—Chrome Steel
Nic-Steel—Nickel Steel
Nic-Van—Nickel Vanadium

Column 21:
A—Amidships
On Eng—On Engine

Column 22:
C—Center

Column 23:
Opt—Optional

Fewer Firms in Isolated Electric Plant Field

1922 specifications indicate a reduction in number of firms. Plants listed divide into two classes: those for domestic and those for industrial uses. Most generators direct connected to engine. Governors provided by every maker. Outputs vary from .3 to 25 K.W. Watercooling predominates.

IN comparing the 1922 table of isolated electric lighting plants with that of last year the first thing that attracts attention is the great reduction in the number of makes represented. We are not prepared to say that all of the firms listed last year that do not appear in this year's table have discontinued making these plants, although we made every effort to get information from all actively engaged in the business.

The lighting plants listed really divide into two classes, viz., the small plants for domestic or farm use, and the larger plants for marine or industrial purposes. For the small plants the two standard voltages of 32 and 110 seem to be used almost exclusively. There are, however, a few plants which are offered in 65-volt models, and one plant can be had wound for 16 volts. This latter voltage is so low that it is probably furnished to meet very special conditions. Several of the larger plants can be had wound for 220 volts, a voltage commonly used in marine work.

The great majority of the generators are direct connected to the engines, but in addition there are plants having either gear, chain or belt drive. It will be observed that the belt-driven sets usually comprise a low-speed engine. With one exception the engine speed of these sets is not over 500 r.p.m. These low-speed engines have the advantage of more nearly silent and vibrationless running, but this is offset by the much greater floor space required. In this respect the chain and gear-driven sets are intermediate between the direct-connected and belt-driven sets. A gear-driven set occupies hardly any more space than a direct-coupled one, and chain-driven sets also can be made fairly compact.

Thirteen of the 57 plants listed are described as starting automatically. This in the case of sets in which the surplus output of the generator above that going into the line at the time is absorbed by a storage battery, means that the engine is started up automatically as soon as the charge in the battery drops below a certain predetermined point. In the case of so-called batteryless sets, it means that the engine is started up as soon as a light or other current-consuming device is turned on. Twenty of the 57 sets have the automatic stopping feature.

Practically all the smaller sets, those of less than 5 kw., have single-cylinder engines, the only exception being the Kohler, which is a batteryless plant. Most of the engines will run on either gasoline or kerosene. The engines of those sets in which some of the energy is stored in a storage battery operate at practically full load all the time, which makes it comparatively easy to run on kerosene.

Every engine is fitted with a governor. The requirement of reasonably constant voltage evidently makes the use of a governor necessary, though the electrical sets on automobiles operate without this device. Undoubtedly the higher voltage lamps are more sensitive to fluctuations in the electrical pressure and closer regulation is required. In about one-third of the sets an electric governor is used, while the governors on the rest of the engines are of the regular centrifugal type.

In view of the fact that every isolated electric plant has a storage battery connected with it, even those in which none of the current for the consuming devices passes through such a battery. it may seem strange that so many of the plants should use magneto ignition. The explanation undoubtedly is that battery systems are not made for the voltages of these batteries; if the ignition system were connected across a few of the cells of the battery only, the battery would become unbalanced, while charging a separate battery from the generator through a resistance is wasteful. Moreover, the cost of a battery system, together with a battery for same, is not far, if any, less than that of a magneto.

Generator speeds for isolated lighting plants have been standardized by the S. A. E. at 1200 and 1800 r.p.m., and, while these speeds are adhered to in a good many cases, still there is no high degree of uniformity in speeds as yet.

Outputs of the sets vary all the way from 0.3 to 25 kw. The great majority of the sets, however, have an output of from 1 to 1.5 kw. There are listed 10 sets of 1 kw., 8 sets of 1.25 kw. and 10 sets of 1.5 kw. One maker failed to give the ratings of his sets, having evidently stopped rating them. Some of the most successful makers use air-cooled engines, but a far greater number employ water-cooling. The generators of the smallest sets have two poles, but all direct-connected generators of more than 1-kw. output have four poles, and some of the larger ones have six. As to field windings, about half of the sets have compound windings and the other half shunt windings.

There seems to be no relation whatever between the storage-battery capacity furnished and the generator output, and a good many firms give options on batteries of widely differing capacities. An 80-ampere-hour battery is the smallest size furnished with 1-kw. sets, and a 230-ampere-hour the largest. With a larger battery the engine does not have to be started and stopped so frequently, the maximum load capacity of the set is greater and the battery should last longer, but the first cost of the plant increases rapidly with the size of the battery.

More than one-half of the sets are furnished with a power pulley on the engine shaft, so that power machines can be driven directly from the engine instead of only through the intermediary of an electric motor.

Specifications Isolated Electric Plants 1922

Name	PLANT					ENGINE							GENERATOR			BATTERY	
	Voltage	Drive	Automatic Start?	Automatic Stop?	Unit or Separate Construction	No. Cyls. Bore and Stroke	Fuel	Type of Speed Governor	Type Ignition	Normal r.p.m.	Crankshaft Bearings	Engine Cooling	Rated K. W.	No. Poles and Kind Field Winding	No. and Kind Generator Bearings	Standard 72-hr. Rating	Is Power Pulley Provided?
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Alamo	32	Dir	No	Yes	Unit	1-2¼x3¼	G	Elec	Mag	2000	2-1 Brnz. 1 Ball	Water	1	2-Shunt	1-Brnz. 1-Ball	190	No
Cushman	32	Blt	Yes	No	Unit	1-4x4	G	Cent	Bat	800	2-Die	Water	1	2-Comp.	2-Brnz.	Opt	Yes
Dayton	32	Blt	No	No	Sepr									2-Shunt	2-Brnz.	Opt	
Delco	16-32	Dir	SA		Unit	1-2½x3	G or K.	Elec	Bat			Air		4-Shunt			No
Delco	32-110	Dir	SA		Unit	1-3x5	G or K.	Elec	Bat			Air		4-Shunt			No
Delco	110	Dir	SA		Unit	1-3x5	G or K.	Cent	Mag			Air		4-Comp			No
Delco	32-65-110	Dir	SA		Unit	1-3¾x6	G or K.	Elec	Bat			Air		6-Shunt			No
Delco	110	Dir	SA		Unit	1-3¾x6	G or K.	Cent	Mag			Air		6-Comp.			No
D-Light, L1500	32	Dir	No	Yes	Unit	1-3¼x5	G or K.	Cent	Bat	1200	2-Ball	Air	1.5	4-Shunt			Yes
Electrion	32	Dir	Yes	Yes	Unit	1-2⅞x3	G or K.	Elec	Mag	1600	2-Roller	Water	1	2-Shunt	1-Brnz.	80	No
Fairbanks, Morse	32	Blt	No	No	Unit	1-3½x5	G or K.	Cent	Mag	500	2-Bab	Water	.6	-Shunt	2-Ball		Yes
Fairbanks, Morse	32	Blt	No	No	Unit	1-4½x6	G or K.	Cent	Mag	475	2-Bab	Water	1.5	4-Shunt	2-Ball		Yes
Fort Dearborn	32	Gear	No	No	Unit	1-2¾x5	G or K.	Cent	Mag	1000	2-Ball	Air	1	4-Shunt	2-Brnz.	80-160	Yes
Globe	40	Dir	No	No	Unit	1-2¾x4	G or K.	Cent	Bat	1250	2-Bab	Water	1.25	4-Series	2-Ring	110-150-180	Yes
Kero Lectric	32	Dir	No	No	Unit	1-3¼x3¼	G or K.	Elec	Bat	1150	2-	Water	1.	2-	1-Ball	90	Yes
Kohler	110	Gear	Yes	Yes	Unit	4-2x3	G	Cent & Elec	Mag	1000	2-Plain	Air & Water	1.5	4-Comp.	1-Ball		No
Lalley Light	32	Dir	No	Yes	Unit	1-2⅝x2	G	Cent	Bat	1800	2-Ball	Water	1.25	Comp	2-Ball	115	No
Langstadt-Meyer	110	Dir	No	No	Unit	4-3⅛x4½	G	Cent	Mag	950 & 1100	2-Die	Water	4 & 6	4-Comp.	1-Brnz.	Opt	No
Langstadt-Meyer	32	Dir	No	No	Unit	1-3⅛x4½	G or K.	Cent	Bat	1200	2-Die	Water	1.5	4-Shunt	1-Brnz.	128 & 218	Yes
Lincoln-Light	32	Dir	No	Yes	Unit	1-3x3	G or K.	Elec	Bat	1200	2-Ball	Water	1	4-Shunt	2-Ball	190	Yes
Main	32-110	Dir	Yes	Yes	Unit	1-2⅝x2½	G or K.	Elec	Bat	1150	2-Brnz	Water or Oil	1.25	4-Comp.	2-Ball	90	Yes
Main	32-110	Blt	No	No	Sepr	1-3½x5	G or K.	Cent	Mag	400	2-Brnz	Water	.8	2-Shunt	2-Brnz.	90	Yes
Main	110	Blt	No	No	Sepr	1-4½x7	G or K.	Cent	Mag	325	2-Brnz	Water	2	4-Shunt	2-Ring	160	Yes
Marco	32	Chn	No	No	Unit		G or K.	Cent	Mag	800	2-Bab	Air	1.5	4-Comp.	2-Ball	Opt	Yes
Matthews	32	Dir	Yes	Yes	Unit	1-2x3	G		Bat	1250	2-Plain	Water	.3	2-Shunt	2-Plain		No
Matthews	32	Dir	Yes	Yes	Unit	1-3x3	G	Elec	Bat	1250	2-Plain	Water	1	4-Shunt	1-Plain		No
Matthews	110	Dir	Yes	Yes	Unit	4-3¾x4	G	Cent	Mag	1000	3-Plain	Water	10	4-Shunt & Comp	2-Plain		Yes
Matthews	110	Dir	Yes	Yes	Unit	4-3½x5	G	Elec	Mag	900	3-Plain	Water	6	4-Shunt	2-Plain		No
Matthews	110or220	Dir	No	No		4-4½x6	G or K.	Cent	Mag	1000	4-Plain	Water	20	4-Shunt & Comp	2-Plain		No
National	32	Chn	Yes	Yes	Unit & Sepr	1	G or K.	Cent	Mag	1800	2-Die	Air	1.25	4-Shunt	2-Ball	200	Yes
Owen	32	Dir	SA	SA	Unit	1-3x4	G	Cent	Bat	1400	3-Sleeve	Air & Water	1.25	4-Series	1-Sleeve	110	Opt
Phelps	32-110	Dir	No	Yes	Unit	1-3x4	G or K.	Cent	Bat. & Mag	1265	2-Ball	Water	1.5	4-Comp.	2-Ball	140, 290	Yes
Powerlite	32	Dir	No	Yes	Unit	1-3¼x3¼	G or K.		Bat	1200	2-Brnz	Water	1	Series	1-Ball 1-Brnz.	115 & 230	Yes
Reeco	32	Dir	No	No	Unit	1-4x5	G or K.	Cent	Mag	475	2-Sleeve	Water	1.25	4-Shunt	2-Ring	Opt	Yes
Regalite	32	Dir		No	Unit	1-3¼x3½	G or K.		Bat	600	2-Brnz	Air	.75	Comp	1-Brnz.		Yes
Rohaco		Dir	No	No	Unit	1-3x4	G or K.	Cent	Bat	1200	2-Ball	Water	1.5	4-Comp.	2-Ball	170	Yes
Stearns	32	Dir	Yes	Yes	Unit	1-2⅝x3	G or K.	Elec	Mag	1500	2-Ball	Water	.75	2-	1-Ring	110	Opt
Sturtevant	80-250	Dir	No	No	Unit	4-3¼x5	G or K.	Cent	Mag		2-Plain	Water	5	6-Comp.	1-Plain 1-Brnz		No
Sturtevant	80-250	Dir	No	No	Unit	4-4x6	G or K.	Cent	Mag		3-Bab	Water	10	6-Comp.	1-Plain 1-Brnz.		No
Sturtevant	80-250	Dir	No	No	Unit	6-4x6	G or K.	Cent	Mag		4-Bab	Water	15	6-Comp.	1-Plain 1-Brnz.		No
Sunbeam Farm-Lite	32	Dir	Yes	Yes	Unit	1-2¼x3	G	Elec	Bat	1250	1-Ball	Water	.65	4-Series	1-Ball	75	Yes
Swanlite	32	Dir	No	No	Unit	1-3x4	G or K.		Bat	1200	2-Die	Water	1.25	4-Comp.	2-	94-323	Yes
Swartz-Light	32	Dir	Yes	No	Unit	1-3x3¼	G	Elec	Mag	850	3-Bab	Water	1	4-Series	1-Ball	218	No
Swartz-Light, Pioneer	32, 110	Blt	Yes	No	Sepr	1-5x6½	G	Cent	Mag	450	2-Bab	Water	1.5	4-Series	2-Ball	218	Yes
Upco Lite		Dir	No	No		4-4¾x6	G or K.	Cent	Mag	900	Brnz	Air & Water	15	Comp	1-Brnz		Opt
Upco Lite		Dir	No	No		4-6x7	G or K.	Cent	Mag	750	Brnz	Air & Water	25	Comp	1-Brnz		Opt
Upco Lite	110	Dir	No	Yes	Unit	4-3⅛x4½	G or K.	Cent	Mag	1100	3-Brnz	Air & Water	6	6-Comp.	1-Brnz.	220	Opt
Universal	32	Dir	No	Yes	Unit	1-2¾x4	G	Cent	Bat	1200	2-Brnz	Water	1	4-Comp.	1-Roller	120	Yes
Western Electric	32	Dir	No	Yes	Unit	1-3½x4½	G or K.	Cent	Bat	1000	1-Plain	Air	1.5	4-Shunt	1-Plain	288	Yes
Western Electric	32	Blt	No	No	Unit	1	G or K.	Cent	Mag	1800	2-Plain	Water	.5	2-Shunt	2-Plain	144	Yes
Willys Light	32	Dir	No	Yes	Unit	1	G or K.		Bat	1750	2-Sleeve	Air	1.25	4-Shunt		160	Yes
Winton		Dir	No	No	Unit	4-3x4	G	Cent	Mag	1200	2-Bab	Water	5	4-Comp.	1-Bab		No
Winton		Dir	No	No	Unit	6-3x4	G	Cent	Mag	1200	3-Bab	Water	7.5	4-Comp.	1-Bab		No
Wisconsin	32	Blt	No	No	Sepr	1-6½x9	G or K.	Cent	Bat	350	2-Bab	Water		2-Shunt	2-Brass	Opt	Yes
Wisconsin	32	Blt	No	No	Sepr	1-5½x6	G or K.	Cent	Bat	380	2-Bab	Water		2-Shunt	2-Brass	Opt	Yes
Wisconsin	32 & 65	Blt	No	No	Sepr	1-3¼x4½	G or K.	Cent	Bat	400	2-Bab	Water		2-Shunt	2-Brass	Opt	Yes
Worthington	30	Dir & Blt	No	No	Sepr	1-4¾x7	K	Cent	Mag	475	2-Bab	Water	1.5	Shunt	2-	150-180-225-265	Yes

ABBREVIATIONS:—

Blt—Belt
Chn—Chain
Dir—Direct
S A—Semi-Automatic
Sepr—Separate

ENGINE:—
Bab—Babbitt
Bat—Battery
Brnz—Bronze
Cent—Centrifugal
Die—Die Cast
Elec—Electric
G—Gasoline
K—Kerosene
Mag—Magneto

GENERATOR:—
Comp—Compound

BATTERY:—
Opt—Optional

Marine Engine Specifications for 1922

American Marine Engines

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
1922	8	1	6¼x 7½	360	1470	M. & B.
1922	10	1	7¼x 9	340	1850	M. & B.
1922	16	2	6¼x 7½	360	2250	M. & B.
1922	20	2	7¼x 9	340	2925	M. & B.
1922	27	2	8¾x10	320	3975	M. & B.
1922	25	3	6¼x 7½	375	2550	M. & B.
1922	35	3	7¼x 9	350	4075	M. & B.
1922	45	3	8¾x10	325	5050	M. & B.
1922	55	3	8⅝x10½	300	6680	M. & B.
1922	40	4	6¼x 7½	450	3475	M. & B.
1922	50	4	7¼x 9	375	5160	M. & B.
1922	65	4	8¾x10	350	6675	M. & B.
1922	85	4	8⅝x10½	325	8200	M. & B.
1922	65	6	6¼x 7½	500	4825	M. & B.
1922	80	6	7¼x 9	425	6950	M. & B.
1922	100	6	8¾x10	400	8900	M. & B.
1922	125	6	8⅝x10½	375	10800	M. & B.
1922	22-25	2	6¼x 7½	500-600	2150	J. S.
1922	35-40	3	6¼x 7½	500-600	2450	J. S.
1922	50-55	4	6¼x 7½	500-600	3350	J. S.
1922	75-80	6	6¼x 7½	500-600	4800	J. S.
Aerothrust 2-Cycle G.-K.						
1922	3	2	2-2½x2¼	250-1600	85	J. S.
1922	5	2	2-3 x3½	250-1300	115	J. S.
Amphion 2-Cycle G.						
Auth.	3	2	2-2½x2½	900	77	Mag.
Inb.	3	2	2-2½x2½	900	67	Mag.
Anderson 4-Cycle G.-K.						
....	4½	1	4-4½x5	600	400	Mag.
....	8½	2	4-4½x5	600	600	Mag.
....	12½	2	5 x6	550	1000	Mag.
....	25	4	5 x6	550	1600	Mag.
....	50	4	7 x8½	450	3000	Mag.
Arrow 2-Cycle G.-K.						
K-1	2½-3	1	2-2¾x3	700	36	B. or M.
K-2	5-6	2	2-2¾x3	750	60	B. or M.
A-4	4-5	1	4 x4	650	110	B. or M.
C-21	3	1	2-2¾x3	1100	85	Mag.
C-21	3	1	2-2¾x3	1100	80	Mag.
Automatic 4-Cycle G.-K.						
Open base	3	1	4¼x 5	500	300	Opt.
	6	2	4¼x 5	500	525	Opt.
	9	3	4¼x 5	500	760	Opt.
	6	1	5½x 7	400	643	Opt.
	12	2	5½x 7	400	1115	Opt.
	18	3	5½x 7	400	1425	Opt.
	24	4	5½x 7	400	1800	Opt.
	25	2	7½x 9	350	2625	Opt.
	37	3	7½x 9	350	3465	Opt.
	50	4	7½x 9	350	4430	Opt.
	75	3-10	x14	275	8000	Opt.
	100	4-10	x14	275	11780	Opt.
Enclosed	30	4	5 x 7	550	1850	J. S.
	45	6	5 x 7	550	2700	J. S.
	40	4	5½x 7	550	1950	J. S.
	60	6	5½x 7	550	2900	J. S.
	50	4	6½x 8	500	3000	J. S.
	75	6	6½x 8	500	4500	J. S.
	70	4	7½x 9	500	4000	J. S.
	105	6	7½x 9	500	6000	J. S.
	100	4	8½x10	500	6000	J. S.
	150	6	8½x10	500	9000	J. S.
American 2-Cycle G.-K.						
1922	2½	1	3-3¼x3½	800	140	Bat.
1922	4	1	3-3⅞x3½	800	150	Bat.
1922	6	1	4-4¾x4½	800	200	Bat.
1922	8	1	5-5¼x5	600	335	Bat.
1922	8	2	3-3⅞x3½	1000	220	Bat.
1922	8	2	3-3⅞x3½	800	280	Bat.
1922	14	2	4-4¾x4½	700	350	Bat.
1922	20	2	5-5¼x5	600	495	Bat.
Capitol 4-Cycle G.						
HA-4	32-34	4	4-4¼x5½	1000	675	Bat.
HA-4 Spec.	60-65	4	4-4¼x5½	1500-2000	675	Bat.
B. O. E. C. 4-Cycle K. and Fuel Oil.						
A-12¾	50	1	1-12¾x18	250	17000	Aut.
Barker 2-Cycle, G. & K.						
A.	1¼	1	1-3⅜x3½	500	110	Opt.
B.	2½	1	1-4½x4¼	500	170	Opt.
C.	4	1	1-4⅝x5	450	220	Opt.
D.	6½	1	1-5½x6½	400	350	Opt.
G.	8	2	2-4⅝x5	450	380	M. & B.
Bolinders 2-Cycle, Hot Bulb Ignition.						
NEII	500	4	4-20½x29½	160	114000	Surf.
NEII	350	4	4-16½x18⅞	225	52000	Surf.
NEII	270	4	4-15 x16⅛	250	38000	Surf.
NEI	175	2	2-16½x18⅞	225	26000	Surf.
NEI	135	2	2-15 x16⅛	250	19500	Surf.
NEI	100	2	2-13 x13⅜	325	12600	Surf.
NEI	80	2	2-11¾x12⅝	350	9075	Surf.
NEI	60	2	2-10⅝x11	375	7040	Surf.
NEI	50	2	2- 9⅞x 9⅝	425	5225	Surf.
NEI	40	2	2- 8½x 9⅛	450	4180	Surf.
NE	50	1	1-13 x13⅜	325	7700	Surf.
NE	40	1	1-11¾x12⅞	350	5555	Surf.
NE	30	1	1-10⅝x11	375	4840	Surf.
NE	25	1	9⅞x 9⅝	425	3465	Surf.
Brennan 4-Cycle G.						
M.	17-20	4	4 x 5	1000	650	B. & M.
B.	25-35	4	4½x 5	800	750	B. & M.
"B" spec.	35-40	4	4½x 5	1200	700	B. & M.
6B	40-50	6	4½x 5	1200	850	B. & M.
6B Med.	40	6	4½x 5	750	950	B. & M.
11	30-40	4	5 x 5	1000	850	B. & M.
12	35-50	4	5½x 6	800	1100	B. & M.
12	40-80	4	6 x 6	800	1250	B. & M.
6D	75-100	6	4½x 6½	1000	800	B. & M.
Bridgeport 2-Cycle, G.-K.						
40	4½	1	4-4½x5	500	225	Opt.
50	6	1	5-5½x5¼	500	260	Opt.
80	9	2	4-4½x5	500	375	Opt.
100	12	2	5-5½x5¼	500	470	Opt.
R-1	8	1	4-4½x5	800	225	Opt.
S-1	11	1	5-5½x5¼	800	260	Opt.
R-2	16	2	5-5½x5	800	375	Opt.
S-2	22	2	4-4½x5¼	800	470	Opt.
Bridgeport 4-Cycle G.-K.						
142	14	2	5-5½x6½	500	850	Opt.
182	20	2	6-6½x7½	400	1200	Opt.
243	30	3	6-6½x7½	400	1800	Opt.
363	45	3	7-7½x9	375	3200	Opt.
484	60	4	7-7½x9	375	4000	Opt.
Buffalo 4-Cycle G.-K.						
....	3-4	2	3 x 4	700	240	H.T.
....	5-6	2	3½x 5	600	400	H.T.
....	16-20	4	3¾x 5	800	710	H.T.
....	25-30	4	4¾x 5	800	800	H.T.
....	40-60	4	5½x 7	500-800	1730	H.T.
....	50-80	4	6¾x 9	500-800	2600	H.T.
....	10-12	2	5 x 6½	400	1170	H.T.
....	13-15	2	6 x 7½	350	1400	H.T.
....	20-22	2	7 x 9	350	2100	H.T.
....	20-24	4	5 x 6½	400	1960	H.T.
....	26-30	4	6 x 7½	350	2525	H.T.
....	40-45	4	7 x 9	350	3655	H.T.
....	60-70	6	7 x 9	350	4850	H.T.
....	85-100	4-10	x12	300	8200	H.T.
....	125-150	6-10	x12	300	12800	H.T.
H. L. B. 2-Cycle G.						
E.	2-3	1	3.25x3	900	42	J. S.
H. L. B. 4-Cycle G.						
G.	4	2	2.5x5	900	125	J. S.
Cady 2-Cycle G.						
....	1½	1	1-3 x2½	700	45	J. S.
....	3	1	1-3⅝x3¾	700	90	J. S.
....	6	2	2-3⅝x3¾	700	135	J. S.
....	4	1	1-4⅛x4	700	140	J. S.
....	8	2	2-4⅛x4	700	205	J. S.
Cady 4-Cycle G.						
....	12-16	4	3¾x4	1000	300	J. S.
Caille Perfection 2-Cycle G.						
....	2½	1	3-3¼x3½	200-800	140	Bat.
....	3½-4	1	3-3⅝x3½	250-800	150	Bat.
....	6	1	4-4¾x4½	250x800	200	Bat.
....	8	1	5-5¼x5	100-500	335	Bat.
....	7-8	2	3-3⅝x3½	250-850	220	Bat.
....	14	2	4-4¾x4½	250-750	350	Bat.
....	18-20	2	5-5¼x5	100-600	495	Bat.
....	2	1	2-2⅝x2½	700	72	Mag.
....	2	1	2-2⅝x2½	700	61	Bat.
....	2	1	2-2⅝x2½	800	40	Mag.
Caille Perfection 4-Cycle G.						
....	14	4	3-3½x4	100-950	650	Mag.
Knox 2-Cycle G.-K.						
E.	3	1	4 x4	600	205	Opt.
E.	4½	1	4¼x4½	550	250	Opt.
E.	5½	1	5 x5¼	550	330	Opt.
E.	7½	1	5½x6¼	500	500	Opt.
E.	6	2	4 x4	600	340	Opt.
E.	9	2	4¼x4½	550	380	Opt.
E.	11	2	5 x5¼	550	480	Opt.
E.	15	2	5½x6¼	500	760	Opt.
Knox 4-Cycle G.-K.						
F.	25	2	7 x8	500	1900	J. S.
F.	50	4	7 x8	500	3300	B. & M.
F.	75	6	7 x8	500	4500	B. & M.
G.	6	1	5 x5¼	600	575	B. & M.
G.	8	1	5½x6¼	600	700	B. & M.
G.	12	2	5 x5¼	600	950	B. & M.
G.	16	2	5½x6¼	600	1100	B. & M.
Chesapeake 2-Cycle G.						
B.	5	1	5x5	500	275	Bat.
BB.	10	2	5x5	500	475	Bat.
Chesapeake 4-Cycle G.						
L.	7	1	5x6	475	350	Mag.
L.	14	2	5x6	475	575	Mag.
....	20	4	4x5	575	550	Mag.
Honest Clay 4-Cycle G.-K.						
S.	4	1	4½x 5	500	385	Bat.
S.	8	2	4½x 5	500	575	Bat.
R.	6	1	5½x 7	375	675	Bat.
R.	8	1	6½x 7	375	825	Bat.
R.	10	1	7½x 7	375	950	Bat.
R.	12	2	5½x 7	400	1300	Bat.
R.	16	2	6½x 7	400	1525	Bat.
R.	20	2	7½x 7	400	1750	Bat.
R.	25	4	5½x 7	450	2300	Mag.
R.	35	4	6½x 7	450	2600	Mag.
R.	50	4	7½x 7	450	3000	Mag.
O.	25-28	2	7½x 9	375	2650	Bat.
O.	30-35	2	8½x 9	375	2800	Bat.
O.	38-42	2	8½x10¼	375	3000	Bat.
T.	40-50	2	8½x10	375	4000	Mag.
T.	80-100	4	8½x10	375	7000	Mag.
Clift 4-Cycle G.						
....	4	1	3¾x4½	750	250	J. S.
....	8	2	3¾x4½	750	350	J. S.
....	7	1	5 x6	650	600	J. S.
....	15	2	5 x7	600	1200	M. & B.
....	20	2	5¾x7	600	1450	M. & B.
Clift 2-Cycle Semi-Diesel.						
....	100	4	11x13	300	20000	H. B.
Quayle 4-Cycle Hvid.						
4M-28	25-35	4	4¾x6½	650	2150	.....
4S-30	25-35	4	4¾x6½	600	1650	.....
Speedway 4-Cycle G.						
K.	22-28	4	4 x 4½	1000-1400	560	Mag.
Z.	35-44	4	4½x 5½	1000-1200	950	Mag.
N.	50-66	6	4½x 5½	1000-1200	1200	Mag.
M.	48-75	4	5¾x 7	600-1000	1850	B. & M.
M.	75-130	6	5¾x 7	600-1000	2400	B. & M.
M.	130-150	6	5¾x 7	1000-1200	1900	B. & M.
M.	100-175	8	5¾x 7	600-1000	2900	B. & M.
M.	175-200	8	5¾x 7	1000-1200	2350	B. & M.
L.	30-115	6	6¾x 8½	400- 600	5000	B. & M.
R.	250-300	6	6¾x 8½	1000-1300	4000	B. & M.
H.	200-250	6-11	x12	350- 450	11400	B. & M.
Curtiss 4-Cycle G.						
OX-5	90	8-4	x5	1400	*390	Mag.
K-6	150	6-4½x6		1700	*417	Mag.
K-12	400	12-4½x6		2250	*680	Mag.
C-6	160	6-4½x6		1750	*420	Mag.
C-12	400	12-4½x6		2250	*685	Mag.
CD-12	325	12-4½x6		1800	*678	Mag.

*With propeller hub but without oil and water.

Cummins 4-Cycle Heavy Oil.						
M-1	7-8	1-5x7½		550	900	.....
M-2	14-16	2-5x7½		550	1400	.....
M-3	21-24	3-5x7½		550	1800	.....
M-4	30-32	4-5x7½		550	2100	.....
Dodge 4-Cycle Hvid.						
....	12½	1-6¾x9		425	3800	.....
....	25	2-6¾x9		425	4800	.....
....	37½	3-6¾x9		425	6200	.....
....	50	4-6¾x9		425	7400	.....
....	75	6-6¾x9		425	9700	.....
Dow 4-Cycle Diesel.						
A.	320	6-12	x18	250	125000	.....
A.	425	8-12	x18	250	160000	.....
B.	500	6-15	x22¼	220	185000	.....
B.	666	8-15	x22¼	220	215000	.....
C.	500	6-16	x26	175	194000	.....
C.	666	8-16	x26	175	233000	.....
F.	900	6-21¼x28¾		140	325000	.....
H.	1500	6-24⅝x37⅞		125	534000	.....
Dupont 4-Cycle G.						
DT.	20	2-5x6½		700	1100	.....
DF.	40	4-5x6½		700	1600	.....
DS.	60	6-5x6½		700	2150	.....
New Parker 2-Cycle G.-K.						
Simplex	2	1-3x3		900	65	J. S.
Duplex	4	2-3x3		900	110	J. S.
Heav. Duty	4	1-4x4		700	125	Opt.
Elto 2-Cycle G. Outboard.						
....	3	2-2¼x2		1300	47	Bat.

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
Enterprise 4-Cycle K. and Pr. Gas.						
....	6	1-6	x 8	420	1240	M. & B.
....	8	1-6¾	x 8	400	1360	M. & B.
....	10	1-7½	x 8½	375	1490	M. & B.
....	13	2-6	x 8	400	1760	M. & B.
....	16	2-6¾	x 8	400	1910	M. & B.
....	20	2-7½	x 8½	360	3240	M. & B.
....	25	2-8	x 9½	350	3470	M. & B.
....	30	3-6¾	x 8¼	400	3480	M. & B.
....	35	3-7½	x 9½	360	5160	M. & B.
....	45	3-8¼	x10¼	340	5370	M. & B.
....	60	3-9	x11	320	7230	M. & B.
....	40	4-6¾	x 8	400	4220	M. & B.
....	50	4-7½	x 9½	360	5790	M. & B.
....	65	4-8¼	x10¼	350	6480	M. & B.
....	85	4-9	x11	320	10200	M. & B.
....	100	6-8¼	x10¼	350	9890	M. & B.
....	125	6-9	x11	330	12360	M. & B.
....	50	2-9¼	x14	325	11250	Compr.
....	75	3-9¼	x14	325	16875	Compr.
....	100	4-9¼	x14	325	22500	Compr.
....	150	6-9¼	x14	325	33750	Compr.
....	200	8-9¼	x14	325	45000	Compr.
Erd 4-Cycle G.-K.						
T.	30	4-4	x6	900	750	Mag.
A.	42	4-4¾	x6	900	1100	Mag.
Evansville 4-Cycle G.						
....	3½	1-4½	x5	500	300	Bat.
....	7½	2-4½	x5	500	400	Bat.
....	15	4-4½	x5	500	625	Mag.
....	5	1-5	x6	500	400	Bat.
....	10	2-5	x6	500	540	Bat.
....	20	4-5	x6	500	900	Mag.
....	8	1-6	x6¼	500	625	Bat.
....	16	2-6	x6¼	500	900	Bat.
....	24	3-6	x6¼	500	1200	Bat.
....	32	4-6	x6¼	500	1425	Mag.
....	11	1-7	x9	350	1150	Bat.
....	22	2-7	x9	350	1800	Bat.
....	44	4-7	x9	350	2900	Mag.
Evinrude 2-Cycle G.						
Standard	2	1-2⅝	x2½	800	73	Mag.
Heav. Duty	3½	1-3¼	x3	650	116	Mag.
CC.	2	1-2⅝	x2½	800	45	Mag.
DD.	4-5	2-2⅝	x2½	1200	68	Mag.
Fay and Bowen 4-Cycle G.						
L-40	10-17	4-3¼	x4½	800-1400	450	Mag.
LN-43	25-40	4-4½	x5½	800-1400	700-900	Mag.
LN-42	25-40	4-4¾	x5½	600-1000	950	Mag.
L-44	30-45	4-5	x6¼	600-1000	1095	Mag.
L-63	30-50	6-4½	x5½	600-1000	900	Mag.
L-64	45-65	6-5	x6¼	600-1000	1480	Mag.

Models L-40, LN-43, L-44, L-64 made in cast iron construction only. Model L-63 made in aluminum construction only. Model LN-42 made in both aluminum and cast iron construction. Lowest weight applies to aluminum engine. Lowest r. p. m. applies to lowest power rating. Highest r. p. m. applies to highest power rating.

Fraser-Adams 2-Cycle G.						
....	2	1-3½	x3	200-1000	70	J. S.
....	4	2-3½	x3	200-1000	130	J. S.
....	5	1-3¾	x4¼	200-1000	140	J. S.
....	10	2-3¾	x4¼	200-1000	220	J. S.
Frisbie 4-Cycle G.-K.						
A.	5	1-4¾	x5	600	400	Bat.
C.	7	1-6	x6	550	560	Bat.
B.	10	2-4¾	x5	600	525	Bat.
D.	16	2-6	x6	600	825	Bat
R.	18	3-4¾	x5	650	725	Bat.
"T" 2-20	20	2-6	x6	600	1300	Bat.
N.	25	3-6	x6	600	1175	Bat.
E.	30	4-4¾	x5	800	925	Bat.
F.	40	4-6	x6	600	1400	Bat.
"T"4H50	50	4-6	x6	600	2500	Bat.
K.	50	6-4¾	x5	900	985	Bat.
L.	75	6-6	x6	750	2000	Bat.
"T" 4L	100	4-6	x6	1200	2200	Bat.
Gaeth 4-Cycle G. and K.						
....	14-18	2-5½	x8	400-600	1450	M. & B.
....	20-27	3-5½	x8	400-600	1800	M. & B.
....	28-36	4-5½	x8	400-600	2100	M. & B.
....	42-54	6-5½	x8	400-600	3000	M. & B.
....	36-50	4-5½	x8	400-600	2100	M. & B.
....	54-75	6-5½	x8	400-600	3000	M. & B.
Gaffga 2-Cycle G.						
A.	3	1-4	x4	550	225	Bat.
....	4	1-4½	x5	500	325	Bat.
....	5	1-5	x5½	475	350	Bat.
....	6	1-5½	x6	450	425	Bat.
....	8	1-6	x6½	400	475	Bat.
....	6	2-4	x4	550	375	Bat.
....	8	2-4½	x5	500	425	Bat.
....	10	2-5	x5½	475	525	Bat.
....	12	2-5½	x6	450	700	Bat.
....	16	2-6	x6½	400	850	Bat.
Gaffga 4-Cycle G.						
....	12	2-6	x6	600	900	Mag.
Gierhoh 2-Cycle G. Outboard.						
....	2	1-2¾	x2½	900	40-56	Opt.

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
G. B. & S. 4-Cycle G.						
T.	18	4-3¾	x4¼	1000	500	Mag.
Monarch 4-Cycle G.-K.						
....	5- 45	1 to 6-	5x6	525-575	....	Opt.
....	7- 60	1 to 6-	6x7	525-575	....	Opt.
....	72	4-	8x9	375-500	....	Opt.
....	40-168	2 to 6-	10x10	325-450	....	Opt.
Gray 2-Cycle G.-K.						
U.	3-4	1-3½	x3½	700-900	129	J. S.
U.	5½-7	1-4½	x4¼	700-900	185	J. S.
U.	6-8	2-3½	x3½	700-900	240	J. S.
Gray 4-Cycle G.-K.						
UM.	10-25	4-3½	x5	500-1200	650	Mag.
VE.	18-35	4-4	x6	500-1200	850	Mag.
VE	25-50	4-4¾	x6	500-1000	1250	Mag.
Hartford 2-Cycle G.						
X.	3-5	1-4	x4½	500-700	330	M. & B.
X.	6-8	1-4½	x4½	500-700	335	M. & B.
X.	7-10	1-5	x5¼	500-700	440	M. & B.
X.	14-20	2-5	x5¼	500-700	620	M. & B.
Gray-Prior 4-Cycle G.-K.						
D-4	36	4-4½	x8	600-750	1950	M. & B.
Hall-Scott 4-Cycle G.						
L-M-4	125	4-5x7		1700	1100	Del. 2 S.
L-M-6	200	6-5x7		1700	1300	Del. 2 S.
Hess Mono-Marine 4-Cycle G.						
AC	5	1-3¾	x4	950	225	M. & B.
Hettinger 4-Cycle G.						
6	6	1-5½	x6	460	400	M. & B.
9	9	2-4½	x6	450	500	Bat.
12	12	2-5½	x6	450	650	Opt.
18	18	2-6½	x8	400	1500	Bat.
25	25	2-7½	x9	350	2000	Bat.
36	36	4-6½	x8	400	3000	Bat.
50	50	4-7½	x9	350	4500	Bat.
Bud-E 2-Cycle G.						
Bud-E.	5	2-3x3		1200	126	Mag.
J. V. B. 4-Cycle G.-K.						
A4	28-40	4-4¾	x6	600-900	1450	Mag.
A4R	45-60	4-4¾	x6	1000-1450	1350	Mag.
Johnson 2-Cycle G. Outboard.						
....	2	2-2x1½		2100	35	Mag.
Kahlenberg 2-Cycle G.-K.						
1922	2-3	1-3½	x 3½	600	125	M. & B.
1922	3-4	1-4	x 4	550	160	M. & B.
1922	4-6	1-5	x 5	400	400	M. & B.
1922	6-8	1-5½	x 6	400	550	M. & B.
1922	9-12	1-6½	x 7	350	750	M. & B.
1922	12-15	1-7	x 8	325	900	M. & B.
1922	6-8	2-4	x 4	550	350	M. & B.
1922	8-12	2-5	x 5	400	650	M. & B.
1922	12-16	2-5½	x 6	380	950	M. & B.
1922	18-24	2-6½	x 7	350	1300	M. & B.
1922	24-30	2-7	x 8	325	1800	M. & B.
1922	30-36	2-7¾	x 8	325	2000	M. & B.
1922	50-55	2-9	x10	300	3400	M. & B.
1922	27-36	3-6½	x 7	325	1700	M. & B.
1922	36-45	3-7	x 8	325	2600	M. & B.
1922	45-54	3-7¾	x 8	325	2800	M. & B.
1922	75-85	3-9	x10	300	5000	M. & B.
Kahlenberg 2-Cycle, Surface Ignition.						
1922	30-36	2- 8½	x 9	375	6000	Surf.
1922	45-54	3- 8½	x 9	375	8000	Surf.
1922	60-70	4- 8½	x 9	375	10000	Surf.
1922	50-60	2-10	x10½	340	8500	Surf.
1922	75-90	3-10	x10½	340	10000	Surf.
1922	100-120	4-10	x10½	340	15000	Surf.
1922	150	3-..	.....	...	23000	Surf.
1922	200	4-..	.....	...	30000	Surf.
Kermath 4-Cycle G.-K.						
3	3	1-3¼	x4	600	125	Mag.
4	4-5	2-3½	x4	800	300	Mag.
6	6-8	2-3¾	x4	800	325	Mag.
12	10-12	4-3½	x4	600-1200	470	Mag.
16	16-18	4-3¾	x4	600-1200	500	Mag.
20	20-25	4-4	x4	600-1200	535	Mag.
40	24-40	4-4½	x6¼	500-1200	1350	Mag.
Barber 2-Cycle G.						
....	2½	1-3¼	x3¼	750	75	J. S.
....	5	2-3¼	x3¼	750	140	J. S.
....	8	3-3¼	x3¼	750	190	J. S.
....	4	1-4	x4	600	150	J. S.
....	8	2-4	x4	600	270	J. S.
....	12	3-4	x4	600	390	J. S.
....	6	1-4¾	x4¾	600	245	J. S.
....	12	2-4¾	x4¾	600	375	J. S.
....	18	3-4¾	x4¾	600	500	J. S.
....	9	1-5½	x5¼	500	270	J. S.
....	18	2-5½	x5¼	500	535	J. S.
....	27	3-5½	x5¼	500	675	J. S.
Barber 4-Cycle G.						
....	3	1-3½	x5	600	125	J. S.
V.	7	2-3½	x5	600	150	J. S.

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
Knox Valve-in-Head 4-Cycle G.-K.						
350	40	4-5	x5½	800	1100	M. & B.
940	20	4-3½	x5	900	780	Mag.
Koban 2-Cycle G. Outboard.						
H.	3	2-2⅝	x2¾	800-900	80	M. & B
Lathrop 2-Cycle G.-K.						
1922	3	1-4	x4	500	....	Opt.
1922	4	1-4½	x5	500	....	Opt.
1922	5	1-5½	x5	500	....	Opt.
1922	6 Lt.	1-5½	x5	500	....	Opt.
1922	6 St.	1-5¼	x6½	400	....	Opt.
1922	7	1-6	x6½	375	....	Opt.
1922	8	1-6½	x6½	375	....	Opt.
1922	10	1-7	x7½	300	....	Opt.
1922	12	1-7½	x7½	275	....	Opt.
1922	8	2-4½	x5	550	....	Opt.
1922	10	2-5½	x5	500	....	Opt.
1922	12 Lt.	2-5½	x5	500	....	Opt.
1922	12 St.	2-5¼	x6½	400	....	Opt.
1922	14	2-6	x6½	400	....	Opt.
1922	16	2-6½	x6½	400	....	Opt.
1922	20	2-7	x7½	300	....	Opt.
1922	24	2-7½	x7½	275	....	Opt
1922	36	3-7½	x7½	275	....	Opt.
Lathrop 4-Cycle G.-K.						
1922	12	2-5⅜	x6½	500	....	Opt.
1922	16	2-5½	x6½	500	....	Opt.
1922	21	3-5½	x6½	500	....	Opt.
1922	30	3-5½	x6½	700	....	Opt.
1922	28	4-5⅜	x6½	500	....	Opt.
1922	40	4-5½	x6½	700	....	Opt.
1922*	16	2-5½	x8	400	1500	J. S.
1922*	24	3-5½	x8	400	2000	J. S
1922*	32	4-5½	x8	400	2400	J. S.
*Gasoline only.						
Leroi 4-Cycle G.						
2C	15	4-3½	x4½	1000	450	Opt.
Loane 4-Cycle G.-K.						
Crabber	3½	1-3¾	x5	750	250	J. S.
Fisherman	6	1-5	x6	600	650	J. S.
Fisherman	12	2-5	x6	600	1050	J S.
Ford	12-16	4-3¾	x4	1200	450	J. S.
Fisherman	18	3-5	x6	600	1350	J. S.
Fisherman	24	4-5	x6	600	1500	J. S.
Lockwood-Ash 2-Cycle G.						
Outboard	2	1-2⅝	x2½	700	65	Mag.
24	2½	1-3¼	x3½	750	....	J. S.
24	4	1-4	x4	750	....	J. S.
68	6	2-3½	x3½	800	....	J. S.
68	8	2-4	x4	800	....	J. S.
44*	14	4-3¾	x4½	800	600	Mag.
*4-Cycle.						
Maynard-Adams 4-Cycle G.-K.						
....	3½	1-3¾	x4	700	....	Mag.
....	8	2-3¾	x4¼	700	....	Mag.
Mecco 4-Cycle G.						
A.	4	1-4¼	x5	600	220	Mag.
B.	5	1-5	x6	500	375	Mag.
AA.	9	2-4¼	x5	600	375	Mag.
4A.	16	4-4¼	x5	600	500	Mag.
C2	12	2-5½	x6½	500	550	Mag.
C3	18	3-5½	x6½	500	775	Mag.
Mianus 2-Cycle G., K., etc.						
A.	3	1-4	x4	550	175	M. & B.
A.	5	1-4⅝	x5	500	280	M. & B.
A.	7½	1-5⅜	x6	450	415	M. & B.
A.	10	1-6½	x7	375	675	M. & B.
A-2	6	2-4	x4	550	300	M. & B.
A-2	10	2-4⅝	x5	500	500	M. & B.
A-2	15	2-5⅜	x6	450	750	M. & B.
Mianus 4-Cycle G.						
F-2	16	2-6	x8	400	1600	M. & B.
F-3	24	3-6	x8	400	2200	M. & B.
F-4	32	4-6	x8	400	2750	M. & B.
Mianus Diesel 2-Cycle.						
7½	7½	1-5⅜	x6⅝	500	1000	Comp.
15	15	2-5⅜	x6⅝	500	1700	Comp.
30	30	2-7⅛	x9⅞	360	5100	Comp.
45	45	3-7⅛	x9⅞	360	6500	Comp.
60	60	4-7⅛	x9⅞	360	8200	Comp.
90	90	6-7⅛	x9⅞	360	13000	Comp.
Michigan Marine Motor 4-Cycle G.						
....	4	1-3¾	x4½	750	115	Opt.
Mietz Semi-Diesel 2-Cycle.						
....	15	2- 6x	6½	500	1995	Hot bulb
....	22	3- 6x	6½	500	2520	Hot bulb
....	40	2- 9x10		400	6300	Hot bulb
....	50	2-10x12		340	11000	Hot bulb
....	60	3- 9x10		400	7500	Hot bulb
....	75	3-10x12		340	14000	Hot bulb
....	100	4-10x12		340	18000	Hot bulb
....	150	3-14x18½		240	35000	Hot bulb
....	200	4-14x18½		240	42000	Hot bulb
....	350	4-16x21		210	65000	Hot bulb

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
Murray & Tregurtha 4-Cycle G.						
E-2	18-20	2	6½x 8	425	1867	M. & B.
E-3	25-35	3	6½x 8	450	2216	M. & B.
E-4	40-50	4	6½x 8	450	2916	Opt.
E-6	60-75	6	6½x 8	500	3560	Opt.
F-4	60-70	4	7½x10	375-425	4667	Opt.
F-6	90-110	6	7½x10	400-450	6990	Opt.
K-6	300	6	6¼x7¾	1650	2100	J. S.
J-6	400	6	7¾x 9	1400	4000	J. S.
Miller 4-Cycle G.-K.						
F-1	4	1	4½x5	600	400	M. & B.
I-1	6	1	5¼x6	500	500	M & B.
F-2	10	2	4½x6	600	600	M. & B.
I-2	14	2	5¼x6½	500	800	M. & B.
E-4	12-20	4	3½x5	6-900	650	Mag.
F-4	18-24	4	4½x6	5-800	1200	Mag.
I-4	24-30	4	5¼x6	5-700	1500	Mag.
R-4	28-35	4	5¾x7½	4-550	1900	Mag.
S-4	40-50	4	6 x9	350-450	2700	Mag.
P-1*	2½	1	2¾x2½	850	70	Mag.
*Gasoline only.						
Missouri 4-Cycle G.						
....	8	2	4½x5	500	....	J. S.
....	12	2	5 x6	500	....	J. S.
....	18	4	4½x5	500	....	J. S.
....	24	4	5 x6	500	....	J. S.
Missouri 2-Cycle Semi-Diesel.						
....	7	1	5x6	500	....	Hot ball
....	14	2	5x6	500	....	Hot ball
....	22	3	5x6	500	....	Hot ball
....	30	4	5x6	500	....	Hot ball
N. & S. 4-Cycle Dist.						
Cub	4	1	3¾x 5	800	350	M. & B. and J. S.
Marine	20	2	7 x 9	350	3200	M. & B.
heavy duty	20	2	7 x 9	350	2800	M. & B.
	30	2	8 x10	325	3500	M. & B.
	40	3	8 x 9	325	4600	M. & B.
	80	3	10½x12	320	8000	M. & B.
Ferdmarine 4-Cycle G.						
....	10-15	4	3¾x4	800-1000	550	Mag.
N. L. S. E. Co. 4-Cycle Diesel.						
....	120	4	9 x12½	350	17400	.....
....	180	6	9 x12½	350	22820	.....
....	240	8	9 x12½	350	28375	.....
....	240	4	13 x18	240	34400	.....
....	360	6	13 x18	240	56940	.....
....	480	8	13 x18	240	76000	.....
....	600	6	16½x24	225	120000	.....
20th Century 4-Cycle G.						
1922	15-20	2	6¼x8½	400	2000	Mag.
1922	40-50	4	6½x8½	400	3400	Mag.
1922	65-75	6	6½x8½	400	4500	Mag.
Niagara 4-Cycle G.						
E2	12	2	4¾x5½	900	625	M. & B.
E4	22-35	4	4¾x5½	1000	925	M. & B.
D4	40-80	4	6¼x7	1000	1650	M. & B.
D6	60-120	6	6¼x7	1000	2350	M. & B.
D8	80-160	8	6¼x7	1000	3250	M. & B.
Special	5-15	4	2½x4	1000	300	M. or B
Ontario 2-Cycle G.						
....	2	1	2½x3	1650	70	Opt.
....	3	1	3½x3½	900	125	Opt.
....	6	2	3½x3½	900	190	Opt.
....	9	3	3½x3½	900	270	Opt.
....	12	4	3½x3½	900	350	Opt.
....	7	1	5 x5	450	300	Opt.
....	14	2	5 x5	600	500	Opt.
....	21	3	5 x5	600	700	Opt.
....	28	4	5 x5	600	900	Opt.
Palmer 4-Cycle G.						
NL1	3½	1	4½x 4½	4-600	350	Bat.
NL2	7	2	4½x 4½	4-600	350	Bat.
RW1	5½-6½	1	5½x 6	4-600	425	Bat.
RA1	4½	1	4½x 6	4-600	375	Bat.
RA2	9-11	2	4½x 6	4-600	650	Bat.
TM	10	4	2¾x 3¼	1000-1500	260	Bat.
VH	14	4	3 x 4½	1000-1200	700	Bat.
NR1	5-6	1	5 x 6	4-600	400	Bat.
NR2	10-12	2	5 x 6	4-600	750	Bat.
NR3	15-18	3	5 x 6	4-600	1000	Bat.
NR4	20-24	4	5 x 6	4-600	1250	Bat.
F2	16-18	2	6½x 8	350-400	1600	Bat.
F3	24-26	3	6½x 8	350-400	2000	Bat.
F4	32-35	4	6½x 8	350-400	2400	Bat.
F6	50-60	6	6½x 8	350-400	3800	Bat
NK2	20-25	2	7½x10	3-400	3000	Bat.
NK3	30-35	3	7½x10	3-400	3500	Bat.
NK4	45-50	4	7½x10	3-400	4200	Bat.
NK6	75-80	6	7½x10	3-400	5600	Bat.
Palmer 2-Cycle G.						
C*	4	1	4½x4½	450	240	M. & B.
D*	6	1	5 x6	450	350	M. & B.
Q1	2½	1	3¾x3½	700	125	J. S.
Q2	5	2	3¾x3½	700	180	J. S.
P1	4	1	4½x4½	650	210	J. S.
P2	8-10	2	4½x4½	650	325	J. S.
*Also kerosene.						

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
Sturtevant 4-Cycle G.						
E-4	75	4	4-4½x6	1600	700	Mag.
Sumner 2-Cycle Heavy Oil.						
F.	350	4	16½x22	200	40000	Surf.
S.	600	6	16½x22	200	80000	Surf.
Stork 2-Cycle G.						
....	3	1	3½x3½	700	120	J. S.
....	4	1	4 x 4	700	180	J. S.
....	6	1	4½x4½	700	225	J. S.
....	8	1	5 x5	700	370	J. S.
....	6	2	3½x3½	700	200	J. S.
....	8	2	4 x4	700	400	J. S.
....	12	2	4½x4½	700	450	J. S.
....	16	2	5 x5	700	555	J. S.
....	12	3	4 x4	700	550	J. S.
....	18	3	4½x4½	700	600	J. S.
Stork 4-Cycle G.						
....	8	2	4½x5½	600	700	J. S.
....	10	2	5 x6	500	900	J. S.
....	12	2	5½x6¼	500	900	J. S.
....	16	2	6 x7	400	1500	J. S.
....	20	2	6¾x8	400	2000	J. S.
....	25	2	7½x9	400	2500	J. S.
....	16	4	4½x5½	700	1200	M. & B.
....	20	4	5 x6	500	1500	M. & B.
....	24	4	5½x6½	500	1500	M. & B.
....	32	4	6 x7	400	3000	M. & B.
....	40	4	6¾x8	400	3500	M. & B.
....	50	4	7½x9	400	4500	M. & B.
....	30	6	4½x5½	700	1400	M. & B.
....	50	6	5½x6¼	700	1800	M. & B.
....	75	6	7½x9	400	6000	M. & B.
Union 4-Cycle G.-K.-Dist.						
Marine	7	1	5½x 6¾	450	....	M. & B.
....	14	2	5½x 6¾	500	....	M. & B.
....	21	3	5½x 6¾	500	....	M. & B.
....	28	4	5½x 6¾	500	....	M. & B.
....	35	3	7½x 9	360	4825	M. & B.
....	45	3	8¼x10½	330	6450	M. & B.
....	60	3	9 x11	320	7400	M. & B.
....	80*	3	10 x12	310	10700	M. & B.
....	85	4	9 x11	330	10140	M. & B.
....	110*	3	12 x15	280	17600	M. & B.
....	110*	4	10 x12	330	12350	M. & B.
....	150*	4	12 x15	290	22750	M. & B.
....	225*	4	14½x18	225	36400	M. & B.
....	250*	4	15¼x20	200	49785	M. & B.
....	300*	4	16 x21	210	55700	M. & B.
....	125	6	9 x11	320	14400	M. & B.
....	225*	6	12 x15	300	30600	M. & B.
....	325*	6	14½x18	225	50400	M. & B.
....	375*	6	15½x20	200	69100	M. & B.
*Open crosshead cylinders.						
Universal 4-Cycle G.-K.						
C	9-12	4	2½x4	1200	325	Opt.
Doman 4-Cycle G.-K.						
K	4	1	3¾x4½	600	225	M. or B.
B1	5-7	1	4¾x6	400-600	550	M. or B.
HM2	12-15	2	4¾x6	600-800	750	Mag.
HM4	25-40	4	4¾x6	600-900	1200	Mag.
T2	20-25	2	6 x7	400-800	1200	Mag.
T4	40-50	4	6 x7	400-800	1950	Mag.
Van Blerck 4-Cycle G.						
M-4	75-100	4	5¾x6	1000-1500	1798	M. & B.
M-6	112-150	6	5¾x6	1000-1500	2100	M. & B.
M-8	152-200	8	5¾x6	1000-1500	2667	M. & B.
MM-4	37-65	4	5¾x6	600-1000	1798	M. & B.
MM-6	52-94	6	5¾x6	600-1000	2100	M. & B.
MM-8	70-125	8	5¾x6	600-1000	2667	M. & B.
Vulcan 4-Cycle G.						
....	4	1	4½x 6	500	300	J. S.
....	5	1	5¼x 7	500	400	J. S.
....	7½	1	6¼x 7¼	450	600	J. S.
....	11	1	7¼x 8½	400	900	J. S.
....	8	2	4½x 6	550	650	J. S.
....	10	2	5¼x 7	500	900	J. S.
....	15	2	6½x 7¼	475	1300	J. S.
....	22	2	7¼x 8½	425	2200	J. S.
....	25	3	6½x 7¼	475	1700	J. S.
....	35	3	7¼x 8½	425	2800	J. S.
....	56	3	8¾x10½	400	4200	J. S.
....	16	4	4½x 6	550	900	J. S.
....	20	4	5¼x 7	500	1200	J. S.
....	30	4	6½x 7¼	475	2050	J. S.
....	45	4	7¼x 8½	425	3400	J. S.
....	75	4	8¾x10½	375	5500	J. S.
....	40	6	5¼x 7	550	1750	J. S.
....	70	6	7¼x 8½	425	4500	J. S.
Winona 2-Cycle G.						
....	5	1	4½x4½	700	....	J. S.
....	10	2	4½x4½	700	....	J. S.
....	15	3	4½x4½	700	....	J. S.
....	20	4	4½x4½	700	....	J. S.
Western 4-Cycle Diesel.						
....	75	3	9½x14	325	21000	Comp.
....	100	4	9½x14	325	26000	Comp.
....	150	6	9½x14	325	35000	Comp.

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
Goshen 2-Cycle G. (White Mfg. Co.).						
A.	4	1	4x5	500	135	Bat.
B.	8	1	5x6	500	200	Bat.
E.	9	2	4x5	500	280	Mag.
F.	14	2	5x6	500	410	Mag.
Winton 4-Cycle G.						
W6	80	6	6½x 9	450	5400	Mag.
W5	125	6	8 x11	400	10000	Mag.
W11	200	6	9½x14	450	18000	Mag.
W28	150	6	6½x 9	900	4000	Mag.
W29	200	8	6½x 9	900	5000	Mag.
Winton 4-Cycle Diesel.						
W24A	300	6	12⅜x18	210	34 tons	.....
W35	200	6	11 x14	250	22 tons	.....
W40	400	8	12⅜x18	210	42 tons	.....
52	50	3	7½x11	425	5¾ tons	.....
53	75	4	7½x11	425	7½ tons	.....
54	125	6	7½x11	425	12 tons	.....
58	150	4	11 x14	260	15 tons	.....
Wisconsin 2-Cycle G.						
A.	5	1	4 x4	700	160	Bat.
B.	7	1	4½x4½	700	190	Bat.
C.	10	2	4 x4	750	240	Bat.
D.	15	2	4½x4½	750	300	Bat.
E.	20	3	4 x4	850	340	B. & M.
F.	27	3	4½x4½	900	400	B. & M.
J-L	2	1	2⅝x2½	750	55	Bat.
K-M	2	1	2⅝x2½	750	55	Mag.
N	3½	1	3¼x3¼	750	100	Mag.
Wisconsin 4-Cycle G.						
EM.	24	4	4 x5	1000	625	Mag.
AM.	40	4	4¾x5½	1000	800	Mag.
JM.	48	4	5.1x5.5	1000	800	Mag.
MM.	62	4	5¾x7	800	1290	Mag.
GM.	60	6	4¾x5½	1000	1360	Mag.
PM.	90	6	5¾x7	800	1565	Mag.
JRM.*	110	4	5.1x5.5	2200	875	Mag.
LRM.	158	6	5.1x5.5	2200	1235	Mag
*Racing engine.						
Wolverine 4-Cycle G.-K.						
Special	5	1	5½x 6	500	600	Mag.
	14	2	6½x 7	400-425	1545	Mag.
	22	3	6½x 7	400-425	2285	Mag.
	32	3	7½x 9	350-375	3914	Mag.
	42	3	8½x 9	350-375	4130	Mag.
	60	3	9½x12	300-325	7000	Mag.
	80	3	11 x12	300-325	7516	Mag.
	110	3	12½x14	300-325	12400	Mag.
	160	6	11 x12	330	13600	Mag.
	200	6	11 x15	330	17110	Mag.
Semi-Heav. Duty	35-40	4	5½x 7	700-800	1800	Mag.
	40	2	8½x11	350	4800	Comp.
....	60	3	8½x11	350	8500	Comp.
....	80	4	8½x11	350	12000	Comp.
Wright Reliable 4-Cycle G.-K.						
S.	10	1	6 x7½	450	1280	Mag.
S.	20	2	6 x7½	450	1810	Mag.
S.	30	3	6 x7½	450	2416	Mag.
S.	40	4	6 x7½	450	3142	Mag.
S.	60	6	6 x7½	450	4630	Mag.
P.	15	1	7½x9	350	1780	Mag.
P.	30	2	7½x9	350	3018	Mag.
P.	45	3	7½x9	350	4068	Mag.
P.	60	4	7½x9	350	5065	Mag.
P.	90	6	7½x9	350	7000	Mag
Workspoon Semi-Diesel 2-Cycle.						
Marine	9	1	*162x*164	500	1325	Hot ball
Marine	16	1	210x240	400	2800	Hot ball
Marine	24	1	236x280	375	3740	Hot ball
Marine	38	2	224x256	375	5450	Hot ball
Marine	55	2	260x290	375	7800	Hot ball
Marine	70	2	280x360	325	9250	Hot ball
Marine	120	2	360x400	300	17500	Hot ball
Marine	140	4	280x360	325	16000	Hot ball
Marine	180	2	420x480	250	25500	Hot ball
Marine	240	4	360x400	300	32000	Hot ball
Marine	360	4	420x480	250	46000	Hot ball
Marine	500	6	420x480	225	70000	Hot ball
*Dimensions in millimeters.						
Workspoon Diesel 2-Cycle.						
....	550	6	420x750	165	100000	.....
....	850	6	520x900	135	140000	.....
....	150	3	300x500	225	30000	.....
....	200	4	300x500	225	40000	.....
Peerless 4-Cycle G.-K.						
....	5-6	1	5 x6	850	450	Bat.
....	10-12	2	5 x6	850	600	Bat.
....	16-20	4	4 x6	1000	750	M. & B.
....	25-35	4	5 x6	1000	850	M. & B.
....	20-24	2	5¾x7	700	1200	M. & B.
....	40-50	4	5¾x7	700	1700	M. & B.
Pierce-Budd 2-Cycle G.						
....	4-6	1	4x4	1000-1500	125	Bat.
....	18-25	3	4x4	300-1800	340	Bat.
Red Wing 4-Cycle G.-K.						
D.	10-14	4	2¾x4	1000	340	Opt.
A.	14-20	4	3½x4½	800	670	Mag.
AA.	18-24	4	3¾x4¾	800	680	Mag.
F.	28-36	4	4½x5	1000	780	Mag.
B.	32-40	4	4½x5	1000	830	Mag.

Model	Rated H.P.	No. Cyls.	Bore and Stroke	Normal R.P.M.	Weight Complete Lbs.	Ignition
Regal 4-Cycle G.-K.						
Y*	2		1-3¼x3½	800	130	J. S.
FA.	4		1-4 x4½	800	290	J. S.
UA.	5		1-4½x5½	650	385	J. S.
EA.	7		1-5¼x6½	500	745	J. S. or
JA.	9		1-6½x7	400	1265	M. & B
FB.	8		2-4 x4½	800	540	J. S.
UB.	10		2-4½x5½	700	730	J. S.
EB.	14		2-5¼x6½	500	1040	J. S. or
JB.	18		2-6½x 7	400	1680	M. & B
FC.	16		4-4 x4½	700	730	J. S.
UC.	20		4-4½x5½	650	1035	J. S.
EC.	30		4-5¼x6½	500	1600	J. S.
CB.	32		4-4½x5½	1000	800	Mag.
JC.	36		4-6½x7	400	2700	J. S.
SC.	50		4-7½x9	400	4600	J. S.
SH.	100		8-7½x9	350	8600	J. S.
*Gasoline only.						
Roberts 4-Cycle G.-K.						
H.	8		2-3¾x4	1000	163	Opt.
H-4	16		4-3¾x4	1000	240	Opt.
Smith Marine 4-Cycle G.						
V-12 cyl.	400-500		12-5x7	1700	1250	Bat.
Mohawk 4-Cycle G.						
B20	3½		1-3½x3¾	900	145	Mag.
B21	7		1-4½x4½	900	225	Mag.
B22	7		2-3½x3¾	900	215	Mag.
B23	14-16		2-4½x4½	900	395	Mag.
S24	5-6		1-4½x3¾	1200	155	Mag.
S25	10-12		2-4½x3¾	1200	220	Mag.
S26	15-21		3-4½x3¾	1200	290	Mag.
S27	21-30		3-4½x4½	1200	495	Mag.
M28	6		1-4½x4½	700	275	Mag.
M29	12		2-4½x4½	700	400	Mag.
M30	18		3-4½x4½	700	510	Mag.
H31	5		1-4½x4½	500	310	Mag.
H32	10		2-4½x4½	500	510	Mag.
K33	6		1-4½x4½	700	280	Mag.
K34	12		2-4½x4½	700	410	Mag.
K35	25		4-4½x4½	700	775	Mag.
Scripps 4-Cycle G.-K.						
D-2	10-12		2-4¼x6	500-700	525	M. & B.
D-2	15-18		2-4¼x6	800-1000	525	M. & B.
D-4	25-40		4-4¼x6	600-950	975	M. & B.
D-4	40-60		4-4¼x6	1000-1600	900	M. & B.
D-6	35-55		6-4¼x6	600-900	1400	M. & B.
D-6	60-85		6-4¼x6	1000-1600	1290	M. & B.
Sears, Roebuck & Co. Motorgo 2-Cycle G.						
....	2½		1-3¼x3¼	750	97	Bat.
....	4		1-4 x4	750	135	Bat.
....	6		2-3½x3½	750	154	Bat.
....	8		2-4 x4	750	222	Bat.
Outboard	1¼		1-2⅝x2½	850	70	Bat.
					62	Mag.
Smalley 2-Cycle G.						
MB.	4-6		1-4½x4½	.....	.....	.....
MBB.	12-15		2-4½x4½	.....	.....	.....
Frisco Standard 4-Cycle, G., K., and Dist.						
C.	5		1- 5¾x 6½	400	1555	Opt.
A²	8		2- 4¾x 6	440	1800	Opt.
B²	10		2- 5½x 6	400	2190	Opt.
E.	12		2- 6 x 7	380	2750	Opt.
F.	16		2- 6¼x 7½	360	2930	Opt.
M.	20		2- 7¼x 9	320	4635	Opt.
H.	25		3- 6¼x 7	450	3710	Opt.
K.	30		3- 6½x 8	360	5045	Opt.
O.	40		3- 8 x10	320	6820	Opt.
P.	50		3- 8¾x10½	300	9215	Opt.
O⁴	65		4- 8 x10	360	7120	Opt.
R.	80		3- 9¾x12	280	12310	Opt.
P⁴	85		4- 8¾x10½	350	13150	Opt.
S	110		3-11¾x15	250	20285	Opt.
R⁴	120		4- 9¾x12	320	19500	Opt.
S⁴	175		4-11¾x15	275	28500	Opt.
S⁸	275		6-11¾x15	300	32700	Opt.
Standard 4-Cycle G.						
....	10-12		2- 5 x 6½	400	850	M. & B.
....	16-18		2- 6 x 8	350	1200	M. & B.
....	20-24		4- 5 x 6½	400	1600	M. & B.
....	24-27		3- 6 x 8	350	1800	M. & B.
....	32-37		4- 6 x 8	350	2800	M. & B.
....	50-54		6- 6 x 8	350	3200	M. & B.
....	50-60		4- 6½x 8	550	3250	J. S.
....	65-75		4- 8 x10	350	5300	M. & B.
....	70-90		6- 6½x 8	550	4200	J. S.
....	90-100		6- 8 x10	350	8000	M. & B.
....	125-150		6- 8½x11	350	5800	M. & B.
....	220		6-10 x11	460	6300	M. & B.
....	300		6-12 x14	350	9500	M. & B.
....	500		6-12½x13	350	18000	M. & B.
2K.W.*	4		1- 4½x 4½	750	900	.....
4K.W.*	8		2- 4½x 5½	700	1300	.....
*Auxiliary engines.						
Stearns 4-Cycle G.						
MA*	27-50		4-4¾x6½	500-950	1600	Mag.
MAU*	27-50		4-4¾x6½	500-950	1750	Mag.
MD*	35-60		4-5½x6½	500-950	1650	Mag.
MDU*	35-60		4-5½x6½	500-950	1850	Mag.
MDH.†	60-75		4-5½x6½	500-600	2000	Mag.
MDR**	90-100		4-5½x6½	1500-1650	1150	Mag.
MG††	20-45		4-4¼x6	500-1200	1050	Mag.
MGU††	20-45		4-4¼x6	500-1200	1200	Mag.
MH††	22-50		4-4½x6	500-1200	....	Mag.
MHU††	22-50		4-4½x6	500-1200	....	Mag.
MHR**	65		4-4½x6	1650	....	Mag.
Sterling 4-Cycle G.						
D.	12-15		2-5½x7	400-500	1150	Mag.
FH.	25-55		4-5½x6¾	400-800	2050	M. & B.
FH.	35-85		6-5½x6¾	400-800	2450	M. & B.
FH.	50-115		8-5½x6¾	400-800	2750	M. & B.
FM.	60-85		4-5½x6¾	800-1200	1700	Mag.
FM.	85-125		6-5½x6¾	800-1200	2250	Mag.
FM.	120-170		8-5½x6¾	800-1200	2600	Mag.
FM.	240-300		8-6¾x9	800-1000	5000-5600	Mag.
FS.	90-100		4-5½x6¾	1200-1400	1400	Mag.
FS.	130-145		6-5½x6¾	1200-1400	1750	Mag.
FS.	180-200		8-5½x6¾	1200-1400	2400	Mag.
GR.	150		4-5¾x6¾	1500-1600	Under 1525	Bat.
GR.	225		6-5¾x6¾	1500-1600	Under 2000	Bat.
GR.	300		8-5¾x6¾	1500-1600	Under 2800	Bat.
GM.	98		4-5¾x6¾	600-1200	1875	M. & B.
GH.	63		4-5¾x6¾	400-800	2000	M. & B.
GM.	145		6-5¾x6¾	600-1200	2400	M. & B.
GH.	94		6-5¾x6¾	400-800	2500	M. & B.
GM.	195		8-5¾x6¾	600-1200	2900	M. & B.
GH.	126		8-5¾x6¾	400-800	3000	M. & B.
GRS.	185		4-5¾x6¾	1950	1550	Bat.
GRS.	275		6-5¾x6¾	1950	1960	Bat.
GRS.	365		8-5¾x6¾	1950	2500	Bat.

*†Iron cases. †Incl. flywheel and silent iternal gear reduction drive in unit with flywheel inclosure propeller speed 60% engine speed. **—All aluminum, Lynite rods, high-speed pistons. ††—Aluminum cases.*

British Marine Engine Practice

By M. W. Bourdon

THERE is no great divergence in type among the 160 odd models of marine engines made by approximately 30 British manufacturers. With the Green a notable exception, the vast majority are of a heavy duty pattern departing from automobile practice in many particulars, especially in respect of weight per b.h.p. and normal speed. Nevertheless, a few makers supply a modified car or truck type engine for light craft, though these motors rarely exceed 16-20 hp.; the Green series already mentioned stands quite alone with their separate steel cylinders and copper water jackets and made in sizes up to 450 hp. with from four to eighteen cylinders.

The representative British marine engine, as distinct from the Diesel and semi-Diesel pattern, is a four-cycle motor weighing from 40 to 80 lb. per horsepower and running normally at from 500 to 900 r.p.m. It is designed for kerosene as fuel, either starting on gasoline or having an exhaust jacketed vaporizing chamber heated initially by means of a blow lamp. It is not marked by high efficiency in fuel consumption but is a reliable and durable unit built for hard service.

Many makers have a big range of models, embracing a dozen or more combinations as to cylinder numbers and dimensions; and some of these firms are open to extend the range to meet with a specific demand. But there is, nevertheless, a tendency toward standardizing a smaller number of types and sizes in an endeavor to reduce manufacturing costs, which must obviously be high when a big range is made with such small outputs as are general.

Although the accompanying specification table deals only with gasoline and kerosene engines, it should be stated here that the field of the heavier types of the latter is being invaded by makers of crude oil motors working on the semi-Diesel principle. In fact, Brooke, who for years has specialized in marine engines of the former type, has seen fit to put forward a small single cylinder semi-Diesel motor. The latter type appeals to users of commercial craft, where weight is not so important a consideration as fuel cost.

Among gasoline and kerosene marine engines the four-cycle type very largely predominates, accounting for 93 per cent, the two-cycle motors including the range of the original maker (Day) of the type with crankcase compression, the largest of these being a two-cylinder model termed 16 hp. with a bore and stroke of 4¾ x 4¾ in.

Only 17 per cent of engines are put forward as burning gasoline exclusively, the remainder being offered for either gasoline or kerosene, or for the latter primarily. An impulse starter with magneto ignition is standard on 35 per cent of engines, the former fitting generally being put into or taken out of action by hand. L-head cylinders are the most widely in evidence (67 per cent), the T-head variety, which until comparatively recent years predominated, having still further receded, though still appearing throughout the range of two makers and intermittently in that of another. Valves in the head are exceptional; with an overhead camshaft

(*Continued on page* 398)

British Marine Engines, 1922

Name	H. P.	Two or Four Cycle	No. of Cyls.	Bore and Stroke	Fuel	Normal R.P.M.	Impulse Starter	Lubrication System	Valve Arrgt.	Governor	Type of Water Pump	Type of Oil Pump	Price of Engine Only £	Weight of Engine Only Lb.
A B C	6	4	1-	4¼x 5	Ker	800							72	240
A B C	12	4	2-	4¼x 5	Ker	800							110	360
A B C	20	4	2-	6 x 7	Ker	600							205	800
A B C	36	4	4-	10½x12½	Ker	600							364	1520
A B C	35	2	1-	10½x12½	Ker	350							575	4620
A B C	60	2	2-	10½x12½	Ker	325							895	9100
A B C	120	2	4-	10½x12½	Ker	325							1480	19800
Ailsa Craig	12	4	4-	2¾x 4	Gas. or ker	950	Yes	Press	[1]	No	Plunger	Gear	....	308
Ailsa Craig	4½	4	1-	3½x 4½	Gas. or ker	900	Yes	Press	L	Yes	Plunger	Gear	80	308
Ailsa Craig	9	4	2-	3½x 4½	Gas. or ker	900	Yes	Press	L	Yes	Plunger	Gear	135	420
Ailsa Craig	15	4	4-	3½x 4½	Gas. or ker	900	Yes	Press	L	Yes	Plunger	Gear	260	812
Ailsa Craig	8½	4	1-	4½x 6	Gas. or ker	700	Yes	Press	L	Yes	Piston	Plunger	161	700
Ailsa Craig	26	4	3-	4½x 6	Gas. or ker	700	Yes	Press	L	Yes	Gear	Gear	341	1176
Ailsa Craig	17	4	2-	5 x 5½	Gas. or ker	700	Yes	Press	L	Yes	Piston	Gear	240	924
Ailsa Craig	34	4	4-	5 x 5½	Gas. or ker	700	Yes	Press	L	Yes	Piston	Gear	385	1372
Ailsa Craig	50	4	6-	5 x 5½	Gas. or ker	700	Yes	Press	L	Yes	Piston	Gear	580	1904
Aster	7	4	1-	4¾x 5⅞	Gas. or ker	800	No	Press	L	Yes	Gear	Gear	132[2]	590
Aster	7	4	4-	2⅝x 3⅜	Gas. or ker	1200	No	Circ. spl	L	Yes	Gear	Gear	224[2]	500
Aster	14	4	2-	4½x 5½	Gas. or ker	900	No	Press	L	Yes	Gear	Gear	236[2]	750
Aster	16	4	2-	4¾x 5⅞	Gas. or ker	800	No	Press	L	Yes	Gear	Gear	232[2]	820
Aster	18	4	4-	3⅝x 4¾	Gas. or ker	900	No	Press	L	Yes	Gear	Gear	281[2]	890
Aster	25	4	4-	4½x 5½	Gas. or ker	900	No	Press	L	Yes	Gear	Gear	375[2]	1344
Aster	40	4	4-	5⅛x 5⅞	Gas. or ker	900	No	Press	L	Yes	Gear	Gear	429[2]	1680
Aster	60	4	6-	5⅛x 5⅞	Gas. or ker	900	No	Press	L	Yes	Gear	Gear	842[2]	2300
Aster	90	4	8-	5⅛x 5⅞	Gas. or ker	900	No	Press	L	Yes	Gear	Gear	1000[2]	2910
Atlantic	7	4	2-	3½x 4¾	Ker	1000	Yes	Drip. & Spl	L	Yes	Piston	None	145[3]	.....
Atlantic	14	4	4-	3½x 4¾	Ker	1000	Yes	Drip & Spl	L	Yes	Piston	None	215[3]	.....
Atlantic	10	4	2-	4 x 5	Ker	1000	Yes	Drip & Spl	L	Yes	Piston	None	165[3]	1071
Atlantic	20	4	4-	4 x 5	Ker	1000	Yes	Drip & Spl	L	Yes	Piston	None	250[3]	1280
Atlantic	9	4	1-	6 x 8	Ker	550	Yes	Drip & Spl	L	Yes	Piston	None	165[3]	1452
Atlantic	16	4	2-	5½x 7	Ker	550	Yes	Drip & Spl	L	Yes	Piston	None	265[3]	1590
Atlantic	18	4	2-	6 x 8	Ker	550	Yes	Drip & Spl	L	Yes	Piston	None	300[3]	1753
Atlantic	30	4	4-	5½x 7	Ker	550	Yes	Drip & Spl	L	Yes	Piston	None	350[3]	1908
Atlantic	35	4	4-	6 x 8	Ker	550	Yes	Drip & Spl	L	Yes	Piston	None	450	2546[3]
Atlantic	60	4	6-	6 x 8	Ker	550	Yes	Drip & Spl	L	Yes	Piston	None	750	3000
Barcar	7½	4	1-	5¼x 6	Gas. or ker	750	Yes	Circ. spl	L	No	Piston	Gear	85	784
Barcar	15	4	2-	5¼x 6	Gas. or ker	750	Yes	Circ. spl	L	No	Piston	Gear	190	1120
Barcar	22½	4	3-	5¼x 6	Gas. or ker	750	Yes	Circ. spl	L	No	Piston	Gear	310	1568
Barcar	30	4	4-	5¼x 6	Gas. or ker	750	Yes	Circ. spl	L	No	Piston	Gear	415	1960
Boulton & Paul	3	4	1-	3¼x 4½	Gas. or ker	950	No	Circ. spl	L	Yes	Gear	Spiral gear	85	240
Brit	7	4	1-	5 x 7	Gas. or ker	650	Ex	Drip	L	Ex	Plunger	None	81	500
Brit	14	4	2-	5 x 7	Gas. or ker	650	Ex	Drip	L	Ex	Plunger	None	146	800
Brit	8	4	1-	5½x 8	Gas. or ker	600	Ex	Drip	L	Ex	Plunger	None	94	650
Brit	16	4	2-	5½x 8	Gas. or ker	600	Ex	Drip	L	Ex	Plunger	None	214	1000
Brit	13	4	1-	8 x10	Gas. or ker	350	Ex	Drip	L	Ex	Plunger	None	150	2000
Brit	30	4	2-	8 x10	Gas. or ker	380	Ex	Drip	L	Ex	Plunger	None	240	3000
Brit	45	4	3-	8 x10	Gas. or ker	380	Ex	Drip	L	Ex	Plunger	None	330	4000
Brooke	3	2	1-	3⅜x 3¾	Gas. or ker	850	Ex	Drip & Spl		No	Plunger	None	....	140
Brooke	4	4	1-	3⅝x 4¼	Gas. or ker	950	Ex	Drip & Spl	T	Yes	Eccentric	None	....	160
Brooke	8	4	2-	3⅝x 4¼	Gas. or ker	950	Ex	Circ. spl	T	Yes	Eccentric	Gear	....	425
Brooke	14	4	3-	3⅝x 4¼	Gas. or ker	1000	Ex	Circ. spl	L	Yes	Eccentric	Gear	....	700
Brooke	18	4	4-	3⅝x 4¼	Gas. or ker	1000	Ex	Circ. spl	T	Yes	Eccentric	Gear	....	830
Brooke	25	4	6-	3⅝x 4¼	Gas. or ker	1000	Ex	Circ. spl	L	Yes	Eccentric	Gear	....	1050
Brooke	20	4	2-	5½x 6	Gas. or ker	800	Ex	Circ. spl	T	Yes	Eccentric	Gear	....	1100
Brooke	45	4	4-	5½x 6	Gas. or ker	900	Ex	Circ. spl	T	Yes	Eccentric	Gear	....	1655
Brooke	65	4	6-	5½x 6	Gas. or ker	900	Ex	Circ. spl	T	Yes	Eccentric	Gear	....	2100
Brotherhood-Ricardo	30	4	4-	4⅜x 5½	Ker	900	Ex	Pressure	L	No	Centrif	Plunger	....	1500
Day	3	2	1-	3¼x 3¼	Gas	850	No	Drip & Spl	None	No	Gear	None	38	75
Day	6	2	1-	4⅛x 4½	Gas	800	No	Drip & Spl	None	No	Gear	None	55	175
Day	12	2	2-	4⅛x 4½	Gas	750	No	Drip & Spl	None	No	Gear	None	90	300
Day	16	2	2-	4¾x 4¾	Gas	700	No	Drip & Spl	None	No	Gear	None	110	450
Dixon	10	4	1-	4¾x 6½	Gas. or ker	900	Yes	Press	T	Yes	Gear	Gear	200	634
Dixon	20	4	2-	4¾x 6½	Gas. or ker	900	Yes	Press	T	Yes	Gear	Gear	325	832
Dixon	30	4	3-	4¾x 6½	Gas. or ker	900	Yes	Press	T	Yes	Gear	Gear	440	1200
Dixon	40	4	4-	4¾x 6½	Gas. or ker	900	Yes	Press	T	Yes	Gear	Gear	500	1450
Dixon	60	4	6-	4¾x 6½	Gas. or ker	900	Yes	Press	T	Yes	Gear	Gear	650	1920
Dixon	70	4	4-	6 x 6½	Gas. or ker	950	Yes	Press	F	Yes	Gear	Gear	940	2070
Dixon	105	4	6-	6 x 6½	Gas. or ker	950	Yes	Press	F	Yes	Gear	Gear	1200	2800
Dixon	3½	4	1-	3½x 3½	Gas. or ker	950	Yes	Press	F	Yes	Gear	Gear	100	225
Dixon	7	4	2-	3½x 3½	Gas. or ker	950	Yes	Press	F	Yes	Gear	Gear	175	390
Dixon	14	4	4-	3½x 3½	Gas. or ker	950	Yes	Press	F	Yes	Gear	Gear	280	700
Dixon	250	4	12-	7 x 7½	Gas. or ker	900	Yes	Press	F	Yes	Gear	Gear	....	5068
Dixon	10	4	2-	3¾x 5	Gas. or ker	900	No	Press	L	No	Piston	Piston	180[4]	670
Dixon	15	4	2-	4½x 6	Gas. or ker	800	No	Press	L	No	Piston	Piston	300[4]	1100
Dixon	20	4	4-	3¾x 5	Gas. or ker	900	No	Press	L	No	Piston	Piston	400[4]	1000
Dixon	30	4	2-	6½x 8¾	Gas. or ker	550	No	Press	L	No	Piston	Piston	500[4]	1500
Dixon	40	4	4-	5¾x 7½	Gas. or ker	650	No	Press	L	No	Piston	Piston	560[4]	3200
Dixon	60	4	4-	6½x 8¾	Gas. or ker	600	No	Press	L	No	Piston	Piston	900[4]	5050
Dixon	90	4	6-	6½x 8¾	Gas. or ker	600	No	Press	L	No	Piston	Piston	1280[4]	8300
Fyfe Wilson	10	4	4-	2⅝x 4⅝	Gas	1000	No	Press	L	No	Eccentric	Gear	100	220
Fyfe Wilson	18	4	4-	3½x 5	Gas	1000	No	Press	L	Yes	Gear	Plunger	175	400
Gardner	24	4	2-	6½x 7½	Gas. or ker	600	No	Press	T	Yes	Gear	Gear	....	2800
Gardner	36	4	3-	6½x 7½	Gas. or ker	600	No	Press	T	Yes	Gear	Gear	....	3470
Gardner	48	4	4-	6½x 7½	Gas. or ker	600	No	Press	T	Yes	Gear	Gear	....	4140
Gardner	55	4	3-	8 x 9	Gas. or ker	500	No	Press	T	Yes	Gear	Gear	....	5400
Gardner	75	4	4-	8 x 9	Gas. or ker	500	No	Press	T	Yes	Gear	Gear	....	6050
Gardner	110	4	6-	8 x 9	Gas. or ker	500	No	Press	T	Yes	Gear	Gear	....	9400
Gardner	9	4	2-	4 x 4½	Gas. or ker	1000	No	Press	T	Yes	Gear	Gear	....	420
Gardner	12	4	3-	4 x 4½	Gas. or ker	1000	No	Press	T	Yes	Gear	Gear	....	530
Gardner	17	4	4-	4 x 4½	Gas. or ker	1000	No	Press	T	Yes	Gear	Gear	....	672
Gardner	24	4	2-	5½x 6½	Gas. or ker	800	No	Press	T	Yes	Gear	Gear	....	.....
Gardner	36	4	3-	5½x 6½	Gas. or ker	800	No	Press	T	Yes	Gear	Gear	....	.....
Gardner	48	4	4-	5½x 6½	Gas. or ker	800	No	Press	T	Yes	Gear	Gear	....	.....
Gleniffer	10	4	2-	4¼x 5	Ker	900	Yes	Circ. spl	L	Yes	Piston	Disk	130	900
Gleniffer	24	4	4-	4¼x 5	Ker	900	Yes	Circ. spl	L	Yes	Piston	Disk	255[5]	1350
Gleniffer	36	4	6-	4¼x 5	Ker	900	Yes	Circ. spl	L	Yes	Piston	Disk	370[5]	1670
Gleniffer	12	4	1-	6 x 8	Ker	650	Yes	Circ spl	L	Yes	Piston	Flywheel	185	2200
Gleniffer	25	4	2-	6 x 8	Ker	650	Yes	Circ. spl	L	Yes	Piston	Flywheel	280	2744
Gleniffer	50	4	4-	6 x 8	Ker	650	Yes	Circ. spl	L	Yes	Piston	Flywheel	505	3572
Gleniffer	75	4	6-	6 x 8	Ker	650	Yes	Circ. spl	L	Yes	Piston	Flywheel	745	4400
Grampian	10	4	2-	4 x 5	Gas. or ker	800	No	Spl	L	No	Gear	None	120	560
Grampian	20	4	4-	4 x 5	Gas. or ker	800	No	Spl	L	No	Gear	None	170	800
Green	35	4	4-	4½x 4¾	Gas. or ker	1250	Opt	Press	[1]	No	Gear	Gear	....	224
Green	50	4	6-	4½x 4¾	Gas. or ker	1250	Opt	Press	[1]	No	Gear	Gear	....	384

British Marine Engines, 1922—Continued

Name	H. P.	Two or Four Cycle	No. of Cyls.	Bore and Stroke	Fuel	Normal R.P.M.	Impulse Starter	Lubrication System	Valve Arrgt.	Governor	Type of Water Pump	Type of Oil Pump	Price of Engine Only £	Weight of Engine Only Lb.
Green	60	4	4-	5½x 5¾	Gas. or ker.	1250	Opt	Press.	I[6]	No	Gear	Gear	....	610
Green	100	4	6-	5½x 6	Gas. or ker.	1250	Opt	Press.	I[6]	No	Gear	Gear	....	950
Green	150	4	6-	5⅝x 7	Gas. or ker.	1250	Opt	Press.	I[6]	No	Gear	Gear	....	1220
Green	275	4	12-	5⅝x 6¾	Gas. or ker.	1250	Opt	Press.	I[6]	No	Gear	Gear	....	1540
Green	450	4	18-	5⅝x 7	Gas. or ker.	1250	Opt	Press.	I[6]	No	Gear	Gear	....	2200
Kelvin	3½	4	1-	3½x 4¾	Gas. or ker.	800	Yes	Spl.	L	Yes	Gear	None	80[7]	400
Kelvin	7	4	2-	3½x 4¾	Gas. or ker.	800	Yes	Spl.	L	Yes	Gear	None	108[7]	585
Kelvin	14	4	4-	3½x 4¾	Gas. or ker.	800	Yes	Spl.	L	Yes	Gear	None	158[7]	780
Kelvin	8	4	1-	5½x 7	Gas. or ker.	550	Yes	Spl.	L	Yes	Gear	None	115[7]	820
Kelvin	15	4	2-	5½x 7	Gas. or ker.	550	Yes	Spl.	L	Yes	Gear	None	180[7]	1030
Kelvin	30	4	4-	5½x 7	Gas. or ker.	550	Yes	Spl.	L	Yes	Gear	None	288[7]	1840
Kelvin	30	4	2-	7½x10	Gas. or ker.	410	Yes	Spl.	L	Yes	Gear	None	324[7]	2360
Kelvin	60	4	4-	7½x10	Gas. or ker.	410	Yes	Spl	L	Yes	Gear	None	540[7]	4250
McLaren	10	4	2-	4 x 5	Ker.	850	No	Circ. spl.	L	No	Gear	Gear	....	500
McLaren	20	4	4-	4 x 5	Ker.	850	No	Circ. spl	L	No	Gear	Gear	....	890
McLaren	30	4	6-	4 x 5	Ker.	850	No	Circ spl.	L	No	Gear	Gear	....	1300
Parsons	7	4	1-	4½x 6	Gas. or ker.	800	No	Press.	L	Opt	Eccentric.	Gear	116	470
Parsons	14	4	2-	4½x 6	Gas or ker.	800	No	Press.	L	Opt	Eccentric.	Gear	174	625
Parsons	21	4	3-	4½x 6	Gas. or ker.	800	No.	Press.	L	Opt	Eccentric.	Gear	222	900
Parsons	28	4	4-	4½x 6	Gas. or ker.	800	No	Press.	L	Opt	Eccentric.	Gear	260	1060
Parsons	42	4	6-	4½x 6	Gas. or ker.	800	No	Press.	L	Opt	Eccentric.	Gear	360	1610
Parsons	30	4	2-	6½x 8	Gas. or ker.	600	No[1]	Press.	L	Yes	Eccentric.	Gear	326	2060
Parsons	45	4	3-	6½x 8	Gas. or ker.	600	No[1]	Press.	L	Yes	Eccentric.	Piston	428	2695
Parsons	60	4	4-	6½x 8	Gas. or ker.	600	No[1]	Press.	L	Yes	Eccentric.	Piston	514	3205
Parsons	90	4	6-	6½x 8	Gas. or ker.	600	No[1]	Press.	L	Yes	Eccentric.	Piston	733	5010
Phillip	7	4	1-	4¾x 5½	Gas. or ker.	850							....	600
Phillip	14	4	2-	4¾x 5½	Gas. or ker.	850							....	950
Phillip	28	4	4-	4¾x 5½	Gas. or ker.	850							....	1300
Phillip	20	4	4-	4 x 5½	Gas. or ker.	850							....	950
Pollock (Clyde)	20	4	2-	5½x 6	Ker.	700	Yes	Tr. & press.	I	Yes	Gear	Gear	150	1120
Pollock (Clyde)	40	4	4-	5½x 6	Ker.	700	Yes	Tr. & press.	I	Yes	Gear	Gear	290	1680
Seal	4	4	1-	4 x 3¼	Gas. or ker.	900							....	150
Seal	6	4	1-	5½x 4½	Gas. or ker.	800							....	300
Seal	10	4	1-	6¼x 5½	Gas. or ker.	800							....	450
Thornycroft[8]	15	4	2-	4½x 6	Gas. or ker.	1000	No	Circ. spl.	L	Yes	Gear	Gear	....	924
Thornycroft[8]	30	4	4-	4½x 6	Gas. or ker.	1000	No	Circ. spl.	L	Yes	Gear	Gear	....	1918
Thornycroft[9]	26	4	4-	4 x 5½	Gas. or ker.	1100	No	Circ. spl.	F	Yes	Gear	Gear	....	1316
Thornycroft[10]	50	4	4-	6 x 8	Gas. or ker.	700	No	Circ. spl.	F	Yes	Gear	Gear	....	2912
Thornycroft[10]	75	4	6-	6 x 8	Gas. or ker.	700	No	Circ. spl.	F	Yes	Gear	Gear	....	4000
Thornycroft[11]	70	4	6-	4 x 7	Gas.	1300	No	Circ. spl.	F	No	Gear	Gear	....	1190
Wasp	7	4	1-	4⅛x 6	Ker.	800	No	Circ. spl.	I	No	Plunger	Plunger	....	330
Wasp	14	4	2-	4⅛x 6	Ker.	800	No	Circ. spl.	I	No	Plunger	Plunger	....	530
Watermota[12]	3	2	1-	2¾x 3	Gas. (outboard)	900	No	Pet. & oil[13]	None	No	Plunger	None	62	100
Watermota	3	2	1-	2¾x 3	Gas.	900	No.	Pet. & oil	None	No	Plunger	None	34	60
Watermota	6	2	2-	2¾x 3	Gas.	900	No	Pet. & oil	None	No	Plunger	None	55	95
Wear	5	4	1-	4¼x 6	Gas. or ker.	700	Ex.	Circ. spl.	L	No.	Plunger	Plunger	140	670
Wear	10	4	2-	4¼x 6	Gas. or ker.	700	Ex.	Circ. spl.	L	No	Plunger	Plunger	210	950
Wear	20	4	4-	4¼x 6	Gas. or ker.	700	Ex.	Circ. spl.	L	No	Plunger	Plunger	350	1510
Wear	48	4	4-	6½x 6½	Gas. or ker.	650	Ex.	Circ. spl.	L	No	Plunger	Plunger	680	2660
Wear	70	4	6-	6½x 6½	Gas. or ker.	650	Ex.	Circ. spl.	L	No	Plunger	Plunger	1000	3135
Webber	15	4	2-	4 x 6	Gas. or ker.	800	Ex.	Press.	L	Yes	Plunger	Plunger	170	670
Webber	30	4	4-	4 x 6	Gas. or ker.	800	Ex.	Press.	L	Yes	Plunger	Plunger	....	.....
Wolseley	16	4	4-	3⅝x 4¾	Gas. or ker.	1000	No	Circ. spl.	L	No	Gear	Gear	340	670
Wolseley	30	4	6-	3¾x 5½	Gas. or ker.	1000	No	Circ. spl.	L	No	Gear	Gear	420	950
Wolseley	60	4	6-	4¾x 5¾	Gas. or ker.	1000	No	Circ. spl.	L	No	Gear	Gear	800	1450

1—Overhead Camshaft; 2—Price Includes Reverse Gear, Stern Gear and Kerosene Vaporizer; 3—Price includes Water-Cooled Crankcase, Reverse Gear, Etc.; 4—Price Includes Reverse Gear and Stern Gear; 5—Price and Weight with Reverse Gear, Etc.; 6—For High Speed Boats—with Overhead Camshaft and Electric Starter; 7—Price and Weight with Reverse Gear, Etc.; 8—For Commercial Craft and Auxiliaries; 9—For Fast Launches; 10—For Yachts, Fishing Boats, Etc.; 11—For High Speed Boats; 12—Price and Weight for Whole Outfit; 13—Lubricating Oil Mixed with Fuel.

British Marine Engine Practice

(*Continued from page* 396)

they appear in all one maker's engines—the high efficiency Green motors already mentioned—and a similar arrangement occurs in a small new model Ailsa Craig, a well-established make with a range of four-cylinder types having many features common to automobile truck practice.

Throttle governors appear on 61 per cent of engines. The gear-wheel type of water pump with phosphor bronze gears is most widely favored in British marine engines, being used in 50 per cent; next comes the type consisting of an unringed piston and an eccentric rod, the solid plunger type with cam or crank pin operation coming third; only one engine has the purely centrifugal type of water pump so widely used on cars and trucks. Gear-wheel pumps for oil circulation still more largely predominate, being represented on 72 per cent of engines as against plunger 11 per cent and piston 9 per cent; one maker uses skew cut teeth for the interior pinions. The oil pump is almost invariably outside the sump of the crankcase and is usually located above the crankshaft level to increase accessibility when the engine is in position in the hull.

The majority of engines have a system of lubrication embodying a hollow or drilled crankshaft through which the oil is forced by the pump, but the pressure system rarely extends beyond the crankshaft, the camshaft bearings having catch-pits over them, while splash serves for other interior details. This represents an advance in design over that of quite recent years, when a simple drip feed and splash system was the rule.

In general appearance British marine engines are not "clean"; they do not exhibit an attempt to secure simplicity of controls and connections which characterizes automobile engines; they have the appearance of embodying many afterthoughts, and they are not, in the main, manufactured to very close limits of accuracy or interchangebility. But some of these shortcomings are intentional. The location of oil and water pumps is a case in point; they are purposely placed with exterior drives and well away from the crankcase in order that they may be more accessible when the engine is in position with, usually, its crankcase enclosed in a part of the hull or below bottom-boards.

Exports

Export Figures Show Sound Basis for Future Business

Closing months of 1921 showed an upward trend in American exports. Total business during 1921 reached 28 per cent of 1920 total despite greatly decreased unit value. Comparison of yearly statistics difficult since there never yet has been a normal year in export trade.

By George E. Quisenberry *

A STATISTICAL study of the American foreign trade in automobiles and automotive equipment for 1921 reveals that the year was one of drastic deflation and readjustment, with the low point having been reached in June, July and August, and with the closing months showing the natural upswing that resulted from the bettered business condition of the world in general. The position of the American exporter of automotive products at the end of the year may be likened to that of 1918, when the war closed, with every sign pointing to the larger demand and to the greater volume of shipments that came with the succeeding years. This reassertion of demand is again in evidence and, without a sudden expansion or a boom in the foreground, we well may expect shipments of much increased volume and value.

The trade in late 1921 bore many general resemblances to that of 1918. The volume in the two years was somewhat equal, a comparison of the shipments bearing out this assertion quite closely, and more than one exporter in late 1921 found orders on his books to duplicate almost those that were coming in as the war ceased. The automotive industry then was beginning to readjust itself to a changed state and to sense the demand that was springing throughout the world for automotive vehicles. A somewhat similar situation presents itself to-day. Commerce has gone through its deflation period and is adjusting itself to what, in want of a better term, we may call a normal progress. In this normal progress there is need for automobiles, trucks, tractors and equipment, and this need is again beginning to assert itself. The difference is that the desire a few years ago was for pleasure and luxury vehicles into which to sink wartime profits; to-day the demand calls for vehicles of transportation, essential and necessary in the daily conduct of business, industry and agriculture. This, rather than luxury, will be the basis of our future trade.

A capitulation of the 1921 sales from the United States shows the following results and comparison with the preceding year:

	1921		1920	
	No.	Value	No.	Value
Passenger cars	30,941	$32,573,665	142,508	$165,255,921
Motor trucks	7,402	10,300,404	29,126	46,765,781
Parts and accessories		38,949,574		85,362,093
Tires		16,466,155		52,570,103
Total		$98,029,216		$349,953,898

Porto Rico, Hawaii and Alaska not included.

To this must be added the shipments of tractors, motorcycles and airplanes to complete the statistical story of the year.

Shipments valued at $4,583,234 for eight months, March 1 to Oct. 31, from Canada are shown in tables published elsewhere in this issue.

On the four major items, with no consideration taken of the greatly decreased prices at which these products were sold, the total business in 1921 was just 28 per cent of that of 1920. The wonder is not that the amount was so low but that it was so high. When account is taken of the dumping, by some manufacturers, of long-pending orders in late 1920, the business situation that prevailed in all quarters and the lowering of prices, it will come as a surprise to many that such a total was possible in 1921. This can be accounted for only by the fact that American automotive equipment has won a solid place in international commerce and that its buying could only be slackened and not stopped in the midst of the most drastic deflation the world has ever known. There is every hope for the future of such an industry.

However, the comparison of one year's exports with another is almost a futile pastime. There has never been a normal year in this trade, so short a time has elapsed since the American makers began their overseas efforts and so short has been the time since the world, outside of the United States, began to realize the essential transportation quality of the automobile. However, the sale in 1921 of the major products (cars, trucks, tires and parts and accessories) was nearly three times that of 1914 and just below that of 1918, the figures for these years having been $36,704,073 and $124,016,496, compared with something more than $98,000,000 last year.

And even this total does not reveal the true volume in 1921, due to several factors with which some manufacturers may not be acquainted. These are the overseas construction of Ford cars and the volume of shipments from Canada. Ford assembles cars in many centers, such as Buenos Aires (where his plant within six months or more has been doubled in volume to a capacity of 150 daily), Sao Paulo, Manchester, Cadiz, Bordeaux, Copenhagen, Cork (for tractors) and Yokohama. The cars, trucks and tractors assembled in those cities are as surely American automobiles as though they were made at Highland Park. Their total shows, in the export statistics, only as parts.

*Managing editor, El Automovil Americano.

Ford supplies many territories directly from Canada, the Ford Motor Co. of Canada, Ltd., being authorized to do business with the British dominions and colonies of Africa, Australasia, Asia, including India, and the Pacific. A recent announcement from the Canadian Ford company stated that there were now some 100,000 Ford automobiles in those sections and that, at the end of 1921, shipments were running at about 50 per cent of normal, with steady improvement being recorded.

General Motors, which vies with Ford for first honors in the export field, is now shipping all Buick and Chevrolet orders to every country from its Oshawa, Canada, plant at a rate that in early February, according to a statement of the company, was about 80 per day, and directed to such territories as Argentina, Brazil, Latin America, Australia, Spain and many others. The first of these shipments was made from Oshawa last October, although most of the orders during that month were shipped from the plants in this country. With November, however, all Buick and Chevrolet shipments were made from Oshawa, being cleared from Canadian ports or through New York in bond, thus not showing on the official export statistics from this country. Cadillac and G. M. C. trucks are still going forward from United States plants, as also have been Oakland models. However, with the formation of a Canadian Oakland company, the export shipments on this line also are being transferred to Oshawa. Further, a certain other volume of General Motors sales are credited from the London branch and have no part in either American or Canadian figures.

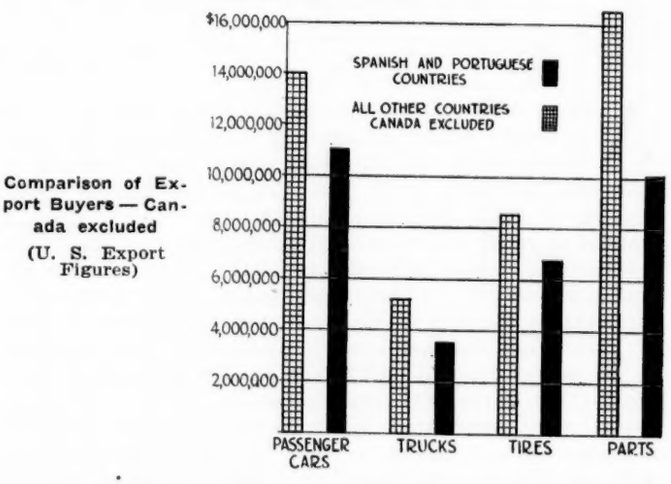
The extent of these Canadian shipments by the General Motors Export Co. during the last two months of 1921 and the opening part of 1922 has not been understood by many American exporters. With a reorganized personnel and with representatives throughout the world ready to take immediate advantage of any change in the general business situation, the company has again built up a heavy schedule of overseas business. Much of the plans of the General Motors Corp. for increased production this year is based upon the expectation that foreign sales will be materially heavier in 1922 than in 1921, and this seems justified by the current volume of export orders.

A statement from the General Motors Export Co. shows shipments of 195 cars to England and 176 to other parts of the world were made from the Oshawa plant in November. These figures were greatly exceeded in December, when 564 cars went to England and 774 to other parts of the world. Besides England, Australia and Argentina were the chief purchasers of these cars, and the company went into 1922 with schedules calling for even heavier shipments. This volume for November and December does not show on either the United States export statistics for the year or in the Canadian tables published elsewhere, these tables ending with Oct. 31. The December shipments of cars from the United States were 2652, as compared with the General Motors Canadian shipments of 1338.

Studebaker, in addition to Ford and General Motors, likewise supplies its overseas demands from Canada to some of those British dominions having preferential tariff arrangements. Other companies, perhaps, are doing likewise.

No previous year in the history of the industry was in any way analogous to 1921. The period opened with certain companies still shipping on old orders that had not been filled while the demand was so high at home in 1919 and 1920. Consequently, the first month or so showed shipments still keeping up to a high level. But these late shipments were to cause many troubles and to halt the normal progress of our export industry throughout the rest of the year. Stocks piled up in foreign centers, as in Buenos Aires which, early in 1921, reported unsold cars totalling 3500, exclusive of Fords. Shipments slackened off under the impact of these excessive deliveries and for months new orders were practically unknown to automotive exporters. The low point was reached, as was stated, in June, July and August, the exporters in the meantime having little other than orders from Mexico to keep them in business. Mexico, for 1921, forms a story in herself, but it was Mexico that for many months kept alive the hope of the automotive foreign sales manager, while dealers and distributers in other countries were valiantly battling against the piled-up surplus of cars.

However, those who made the blackest predictions about the future of automotive exporting did so without consideration of the world's recuperative powers. The



Comparison of Export Buyers — Canada excluded
(U. S. Export Figures)

unsold stocks began to dwindle, as overseas dealers instituted every sort of sales efforts, marked down prices, started time payment plans or otherwise went after the problem that confronted them. The Buenos Aires bugaboo, for instance, blew away. As the year ended, the number of cars unsold in the custom house became nearer 300 than 3500 and new orders were sent by cable or mail to the United States. These new orders, led off by the perpetual exporter Ford, began to appear in September and October and, generally increased from all territories as exchange on the various purchasing countries improved or stabilized themselves. Australia and Argentina have the honor of leading in the new buying, but numerous other countries signalized the better conditions by turning up with actual orders or inquiries, the whole being in greater volume than for many months.

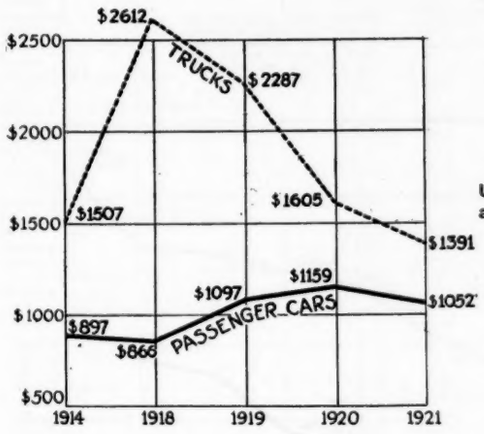
This, in a few words, is the merchandising history of the year—a year that probably will never be duplicated, but one that has cleansed the industry of much of the fungus growth that was its greatest enemy during the excessively prosperous days of 1919 and 1920. Only the better elements in the export business have survived the crash and these firms are preparing now for the more prosperous times that seem so positively on the horizon.

But the statistics for 1921 must not be overlooked to show the localities that have become of importance to the automotive trade. Some rather surprising shifts from 1920 are indicated by the year's totals and these should be studied carefully by manufacturers who are preparing to lay out their foreign sales plans and to develop those international outlets which are so needed to keep production to its highest output.

In order of importance, by the value of cars, trucks,

tires and parts shown in the export statistics, as released by the Bureau of Foreign and Domestic Commerce, but with totals computed by the Class Journal Co., the different territories in 1921 were:

Canada, England, Mexico, Australia, Argentina, Cuba, Dutch East Indies, New Zealand, Japan, Denmark, India, Spain, Sweden, France, Philippine Islands, Brazil, South Africa, China, Uruguay and Belgium. Mexico jumped from fourteenth place in 1920 to third and India dropped from third to eleventh in 1921.



Unit value of cars and trucks exported

Canada, the leader, however, does not come within the province of the export office and England greatly slowed up purchases of completed cars and trucks, the volume to Britain of $12,086,160 for the year having been composed of $7,417,488 for parts and accessories, $3,352,008 for tires, $793,644 for cars and $423,020 for motor trucks. Because of this condition we find the countries of Latin America and the Far East assuming more significance as automotive buyers and these are the markets that the American exporter should cultivate the more strongly. This is borne out by a careful analysis of general conditions. The Far East and Latin America are resting undoubtedly on the most solid business foundations of any sections of the world, excepting the United States, Canada and Great Britain. Argentina is undergoing a commercial change that is truly remarkable, based upon a fundamental overturn affecting her most important crops. Wheat prices have jumped upward some 25 cents or more per bushel since Jan. 1, and this is the period of the Argentine harvest, with her big crops of wheat going on the market at these higher prices. This spells good conditions for the agriculturists of that southern country and should mark their return as buyers. Agentine exchange has appreciated so rapidly that early in February the premium on the dollar had been reduced to 14 or 15 per cent. Linseed, hides, wool and even mutton are being shipped to the United States in volume and the commercial situation in Argentina has improved accordingly, especially as the European purchase of grains and meats also has grown larger. Furthermore, with 75,000 or 80,000 automobiles, Argentina is exceeded in automotive ownership only by the United States, Canada, England, France and Germany.

Australia and New Zealand, under the impulse of somewhat similar conditions, but reflecting the changed commercial aspect throughout the world, developed an actual shortage of automobiles during the last quarter of the year and those manufacturers who were watching their markets with care suddenly found themselves making large shipments to that country. Sterling exchange, the remarkable gains of which are among the outstanding developments in world finance, climbed above $4.35 in early February, to within about 9 per cent of par, and the Australasian condition has reacted in conformity.

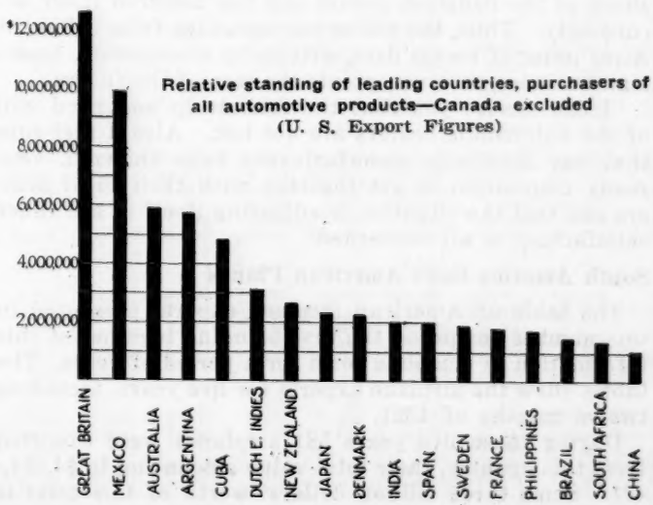
Few exporters to-day look upon Europe, excepting a few countries, as offering many immediate opportunities for the sale of American automobiles and this is amply borne out by the statistical picture. England was second on the list of buyers of all automotive products in 1921, Denmark and Spain were ten and twelve, Sweden and France thirteen and fourteen and Belgium ranked twenty. In the purchase of complete cars, no European nation ranked higher than tenth, as shown by the United States figures, England taking that place, with Spain as eleventh and Netherlands, Switzerland and Belgium fifteenth, sixteenth and seventeenth.

This probably indicates the European situation satisfactorily, with the exception that Spain may not be given sufficient importance. Spanish exchange has climbed materially and the balance of trade between that country and the United States now rests with Spain, due to increasing purchases here of Spanish products. The sale of automobiles there was almost impossible during 1921 because of a restrictive tariff, but that is being changed to a figure favoring imports and many evidences indicate that Spain will return to the automotive markets this year. It should be added that Spain is on a sound financial basis.

Fortunately, automotive buying became more general during the last few months of the year. Mexico, although still keeping up heavy purchases, lost much of the leadership that was hers in 1921, when the automobiles and trucks used in her borders actually increased in number from 40 to 50 per cent. But other countries, resuming trade, cut down the Mexican lead and no longer will that country be the only one in which merchandising effort should be made. Cuba and Porto Rico are taking automobiles again, Venezuela, Brazil and Colombia are buying cars, trucks and equipment. This is true of several territories of the Far East. India, which suffered from heavy overstocks in 1921, is buying in somewhat greater volume and this also is evidenced from the Dutch East Indies and the Philippines. South Africa has responded to the bettered conditions and, like India, should be more of a figure in 1922.

To complete the picture from 1921, it seems desirable to list the chief purchasers of the various products making up the major items. For completed cars (including chassis), the ranking, by value and not by number, was:

Canada, Mexico, Australia, Cuba, Dutch East Indies, Sweden, Japan, India, New Zealand, Argentina, England, Spain, South Africa, China, Philippine Islands, Nether-



Relative standing of leading countries, purchasers of all automotive products—Canada excluded
(U. S. Export Figures)

lands, Switzerland, Belgium, Uruguay, Panama and Venezuela.

On parts and accessories which include shipments to the Ford branches, the order was Canada, England, Argentina, Denmark, Mexico, Cuba, France, Dutch East Indies, Brazil, Australia, Philippine Islands, Peru and Uruguay. The relative standing for motor trucks, by value and not by volume, was Canada, Mexico, Australia, Dutch East Indies, Japan, England, Cuba, Brazil, New Zealand, India, Philippine Islands, Netherlands, Straits Settlements, Sweden, China, Panama, Peru and Trinidad.

An entirely different line-up existed in regard to tires, the leading countries being England, Cuba, Mexico, Canada, Argentina and the Philippine Islands. These were followed by New Zealand, Sweden, Dutch East Indies, India, France, Spain, Denmark, Australia and South Africa.

The Spanish and Portuguese speaking countries played no inconsiderable part in bringing up the totals, despite the severity of their economic readjustment. They are credited with having imported approximately 31 per cent of all American shipments, a percentage that would be materially increased if no account were taken of the exports from this country to Canada. The final quarter of 1921 witnessed an increase of 38 per cent over the third quarter for their purchases. The following comparison has been made of the parts played by these countries in rolling up the export totals of 1920 and 1921. The comparison shows that 39 per cent of all cars in 1921 went to Spanish and Portuguese countries, against 26 per cent in 1920; 33 per cent of the trucks against 31, 41 per cent of the tires against 34 per cent, with parts purchases remaining unchanged at 25 per cent for each period. These figures are percentages of total world shipments.

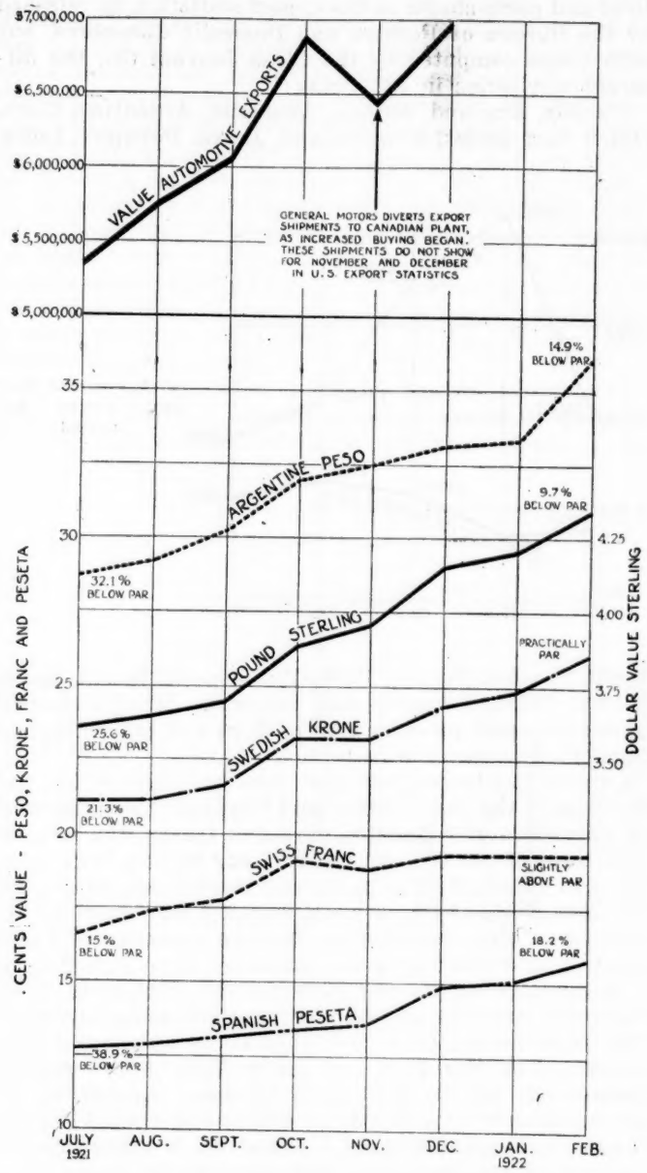
In closing this rather incomplete survey of the export field, it can be said that stocks of unsold cars have completely disappeared in many centers and are nearing liquidation elsewhere. that the adjustment period has proceeded staisfactorily and that the fundamental commercial situation in many countries has undergone a vast improvement in recent months, due to the bettered international aspect, both politically and economically. No considerable European competition, except in regard to tires, high-priced cars and some categories of heavy trucks is yet more than a possibility of the future, except in the European countries themselves. Road and highway improvement activities are under way in many sections and of immediate concern to manufacturers and producers, is the fact that overseas dealers and distributors within recent months have materially enhanced their service and merchandising facilities. The export section of the industry, here at home, has weathered the shock of the deflation period and has bettered itself accordingly. Thus, the following sentences from a Buenos Aires letter of recent date, written by a competent American business observer, points the way of the future:

"I can assure you that the friendship and good will of the automobile dealers are not lost. Also, I feel sure that our American manufacturers have shown a very ready disposition to get together with their local dealers and that the situation is adjusting itself in a manner satisfactory to all concerned."

South America Buys American Planes

The table of American airplane exports presented in this number comprises the first bringing together of this information in complete form for a period of years. The tables show the airplane exports for five years, including twelve months of 1921.

During these five years 581 airplanes were exported from this country, their total value amounting to $4,494,471. Some three million dollars' worth of this total is



Expansion of automotive exports followed exchange betterment during last 6 mo. of 1921

of little interest from an export trade standpoint since it comprised war supplies. The figures for the last three years, however, are of considerable value.

The striking point of these latter year figures is the large proportion of the total bought by Spanish-speaking countries. Out of a total business of $598,174 in 1920, the Spanish countries bought airplanes valued at $498,480. In 1921, the total exports were $314,940, while South America absorbed $222,061 worth. In other words, the trade with Latin America and other Spanish-speaking countries in 1920 amounted to 83 per cent of the total and in 1921 to 71 per cent.

These figures indicate that since the war, South America has furnished by far the best foreign market for American planes, and that there is a possibility of further development along this line. Taking the six-year period covered by the table, the Latin American business does not, of course, comprise so large a per cent of the total as during the last two years, since the war business was European. The Spanish countries did buy 36 per cent of the total value and 19 per cent of the total number.

Exports of Automotive Parts, 1907-1921 (Not Including Engines and Tires)

	1907	1910	1912	1913	1914	1915	1916	1917	1918	July 1 to Dec. 31, 1918	Calendar Year 1919	1920	1921	Totals, inc. 1908, 1909, 1911
Europe:														
Austria	$717	$2,511	$2,195	$4,572	$5,198	$1,045	.....	.....	.....	.....	$825	$363	$2,931	$23,525
Azores and Madeira Islands	.....	50	99	720	1,384	1,800	$1,532	$1,270	$198	$1,600	1,909	4,094	4,173	28,896
Belgium	5,187	9,991	13,614	4,897	20,978	446	.....	.....	906	.....	141,974	246,585	145,056	593,959
Bulgaria	.....	.....	823	40	390	.....	.....	.....	.....	.....	307	89,697	901	102,229
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	182	182
Denmark	2,029	2,339	2,996	6,646	8,664	13,710	31,886	53,917	1,048	5,296	472,376	3,061,296	1,842,018	5,510,411
Finland	.....	.....	1,104	1,799	2,931	1,178	5,627	55	.....	.....	12,137	24,787	22,154	72,258
France	23,477	54,035	85,537	165,950	179,351	480,764	2,216,823	3,700,812	3,999,904	3,158,628	1,966,719	3,980,079	1,099,683	21,210,554
Germany	14,252	10,023	80,036	113,602	213,351	13,770	.....	.....	.....	.....	.....	3,972	20,917	523,500
Gibraltar	.....	57	100	.....	514	229	617	525	61	.....	834	6,166	7,559	15,828
Greece	.....	.....	454	379	807	2,010	24,724	12,604	4,675	13,415	102,715	113,077	80,340	354,727
Latvia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	330	330
Iceland and Faroe Islands	.....	.....	.....	17	180	880	456	2,608	2,757	3,385	13,661	11,903	15,085	46,932
Italy	5,502	4,421	6,304	14,156	50,580	65,521	115,260	180,977	99,947	26,195	100,078	360,856	143,161	1,204,353
Malta, Gozo & Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	54	.....	.....	136	6,822	9,718	16,766
Netherlands	1,049	3,532	6,440	14,135	7,634	3,055	41,525	96,200	3,625	.....	286,540	454,966	203,377	1,129,468
Norway	400	2,684	934	1,636	1,893	15,607	59,769	100,542	18,855	65,253	385,508	483,741	200,547	1,348,732
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50,524	50,524
Portugal	.....	394	865	920	2,357	3,239	45,356	66,929	20,274	11,770	58,031	176,328	36,189	424,375
Roumania	.....	.....	2,734	1,003	887	.....	391	.....	.....	.....	85,087	44,061	42,744	96,367
Russia in Europe	4,004	7,004	1,743	9,566	14,079	123,667	2,498,879	1,624,431	328,633	177	510	13,733	2,690	4,640,188
Serbia, Montenegro and Albania	.....	.....	113	.....	.....	.....	4,932	.....	.....	.....	350	.....	.....	5,395
Spain	3,620	2,854	3,755	3,192	6,266	7,347	32,743	95,720	154,850	52,848	227,977	3,228,719	799,893	4,622,440
Sweden	9,748	3,818	3,789	4,276	6,140	4,211	37,917	26,891	4,032	.....	64,535	472,007	218,718	955,001
Switzerland	178	1,894	.....	457	1,069	400	1,150	565	54	.....	28,177	119,792	53,074	209,001
Turkey in Europe	.....	.....	964	116	.....	267	.....	.....	.....	.....	83,178	103,977	39,741	228,334
England		240,329	931,909	922,866	1,282,388	3,282,973	7,202,475	6,121,211	6,329,114	3,328,599	6,369,838	22,455,836	7,417,488	66,572,848
Scotland	*116,248	238	874	1,485	23,269	29,403	52,414	22,146	955	154,686	53,060	114,476	14,705	475,268
Ireland		54	523	451	250	208	7,181	1,264	.....	.....	16,481	61,382	53,423	141,573
Jugoslavia, Albania, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,184	9,184
North America:														
Bermuda	.....	.....	52	330	254	125	615	64	7	.....	125	219	150	2,195
British Honduras	193	73	165	509	163	684	548	1,379	2,638	1,839	6,183	10,090	3,722	28,633
Canada	195,989	1,023,368	2,392,592	3,104,097	3,663,879	2,741,178	7,492,639	9,148,110	12,054,824	5,677,029	16,865,619	21,635,691	12,241,809	100,438,507
Central American States:														
Costa Rica	255	2,376	1,320	4,516	6,208	5,041	10,162	7,498	23,613	1,924	8,217	20,024	12,303	105,338
Guatemala	24	2,124	2,062	1,851	1,613	732	2,367	9,852	9,111	2,882	20,078	47,260	39,161	147,133
Honduras	1,465	48	151	308	1,053	6,870	15,649	12,639	11,952	4,297	19,884	48,566	34,560	157,850
Nicaragua	160	38	86	741	47	609	666	964	2,264	4,894	26,930	56,222	10,203	103,914
Panama	274	3,180	4,689	11,738	16,988	25,861	34,180	56,657	72,180	26,403	88,546	116,274	123,292	517,654
Salvador	.....	526	2,790	2,242	2,481	2,371	3,717	11,314	10,179	4,206	43,915	45,593	18,394	149,766
Mexico	131,553	81,248	47,479	46,743	41,508	30,819	42,258	125,823	431,440	260,492	704,873	1,074,909	1,528,729	4,735,643
Miquelon, Langley & St. Pierre Is.	.....	.....	.....	.....	300	.....	25	5	65	29	279	69	12	784
Newfoundland and Labrador	132	1,508	2,026	2,993	3,901	3,632	8,672	9,972	4,129	5,245	26,196	28,582	19,018	123,492
West Indies, British:														
Barbados			3,209	5,055	4,177	4,216	6,383	14,452	15,089	7,192	25,902	38,735	31,343	159,619
Jamaica	†2,310	†14,085	23,569	25,355	24,693	32,337	53,867	54,854	65,429	22,071	92,521	196,302	151,667	780,162
Trinidad and Tobago			4,847	9,119	13,003	12,865	21,826	44,060	55,794	24,355	104,251	175,810	116,594	584,321
Other British			1,426	1,157	2,538	3,707	9,303	12,863	21,446	7,706	38,299	40,649	32,036	171,557
Cuba	18,095	49,088	31,594	35,928	48,217	101,429	411,731	906,710	1,028,277	566,079	1,582,241	2,288,292	1,527,363	8,692,920
Danish (Virgin Island of U. S.)	.....	.....	558	1,640	1,206	865	975	1,876	2,844	2,283	12,077	27,642	27,867	79,872
Dominican Republic	.....	253	3,381	1,331	3,439	3,633	12,389	35,301	39,816	44,189	88,744	241,873	124,592	600,101
Dutch	.....	.....	281	1,767	2,754	4,598	3,288	6,052	4,707	1,490	5,435	7,441	16,188	54,243
French	50	101	97	198	8,099	7,423	9,546	24,672	53,518	17,495	83,474	68,954	37,812	311,751
Haiti	.....	.....	331	2,212	1,095	185	3,285	3,962	24,385	7,949	49,922	68,920	39,492	201,853
South America:														
Argentina	10,137	22,150	70,446	74,138	92,663	49,990	222,637	1,458,111	3,088,534	706,571	3,753,370	7,263,624	3,657,631	20,507,821
Bolivia	190	.....	25	172	1,209	2,880	3,453	11,864	14,533	4,891	18,519	19,076	13,029	90,131
Brazil	8,665	7,802	35,680	108,859	84,602	28,633	59,935	134,326	233,414	103,834	806,556	3,144,122	522,831	5,302,245
Chile	3,527	663	2,656	4,711	22,405	14,721	72,939	248,043	806,015	359,668	586,031	426,563	169,605	2,722,908
Colombia	17	2,286	7,681	18,676	19,970	9,695	18,967	27,777	40,717	8,549	77,159	216,772	121,611	577,055
Ecuador	.....	613	3,461	9,115	6,324	4,458	8,014	12,648	12,964	4,251	21,949	49,376	36,582	170,643
Guiana:														
British	.....	1,303	3,181	3,809	4,583	5,116	6,809	23,597	35,081	23,882	40,460	46,122	34,015	230,950
Dutch	.....	7	12	39	911	1,702	2,052	3,212	3,282	1,872	5,511	15,153	9,575	43,928
French	.....	.....	6	125	.....	165	328	11	2,337	17	307	191	248	3,735
Paraguay	.....	.....	32	.....	.....	1,030	848	228	698	21	1,978	8,694	9,369	22,988
Peru	1,666	1,884	1,604	2,550	5,982	4,727	5,458	27,332	88,098	61,925	173,348	434,784	227,387	1,040,422
Uruguay	.....	1,390	12,599	32,978	21,401	14,359	27,086	125,913	183,005	47,408	372,223	608,269	202,044	1,668,404
Venezuela	.....	9	4,648	20,123	36,286	28,750	40,783	87,768	57,873	28,842	110,496	212,835	154,536	784,573
Asia:														
Aden	.....	.....	.....	502	1,676	361	998	4,541	263	6	7,578	12,344	8,025	36,294
China	690	845	2,254	3,134	5,825	5,265	21,661	54,753	60,134	39,714	175,579	302,258	154,017	832,092
Kwantung (leased territory) ‡	.....	.....	.....	.....	.....	.....	46	1,747	672	855	63,831	11,337	5,705	83,896
Chosen	.....	.....	748	2,271	2,791	282	10,377	2,125	2,812	9,506	39,603	82,934	17,157	171,146
East Indies, British:														
British India	2,444	6,387	14,568	18,336	47,923	44,735	129,562	345,855	294,909	99,819	493,188	1,411,866	549,954	3,440,047
Straits Settlements	1,343	1,172	5,273	14,660	25,100	20,388	39,025	70,043	69,968	66,920	151,991	583,215	160,762	746,251
Other British	.....	170	829	901	4,099	4,062	8,540	27,710	23,273	4,100	13,319	95,321	24,740	207,821
Dutch	1,758	4,577	3,452	11,453	15,368	15,232	34,638	193,225	192,430	338,429	488,705	1,041,283	696,269	3,049,749
French	.....	.....	.....	.....	.....	274	.....	.....	1,998	2,367	9,356	42,210	35,329	91,534
Far Eastern Republic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	300	300
Greece in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,154	1,154
Hejas, Arabia, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,909	13,909
Hongkong	123	290	2,711	92	626	1,088	2,180	2,885	7,702	9,764	27,277	44,338	21,106	120,849
Japan	5,021	3,375	39,681	51,619	35,637	26,028	30,446	116,130	319,038	235,317	719,460	624,805	551,981	2,764,619
Persia	.....	.....	.....	.....	.....	174	.....	.....	1,090	3,080	270	8,415	19,143	32,172
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47,941	47,941
Russia in Asia	.....	67	.....	.....	.....	107,351	226,255	146,083	25,512	.....	194,613	18,265	4,233	723,120
Siam	2,134	921	970	1,925	4,905	2,451	34,412	9,734	7,639	3,708	9,479	13,909	19,662	114,306
Turkey in Asia	.....	.....	30	239	67	214	.....	.....	.....	3,764	5,552	83,225	85,153	161,814
Oceania, British:														
Australia	3,826	21,533	102,427	166,176	202,363	199,154	389,690	753,309	1,052,986	963,753	1,462,330	1,855,174	1,033,010	8,291,046
New Zealand	25,625	5,150	26,095	37,438	53,644	48,111	176,618	285,654	309,658	243,468	529,000	1,205,309	452,840	3,418,060
Other British	.....	.....	971	479	1,060	665	1,991	4,751	4,674	2,713	8,330	10,461	7,796	44,202
French	.....	.....	495	3,032	7,560	5,730	5,640	4,383	6,272	2,435	9,906	7,424	10,423	64,500
Other	.....	.....	.....	220	396	.....	66	936	7,138	2,107	7,961	9,037	12,092	40,011
Philippine Islands	4,168	17,154	62,631	53,434	69,933	40,228	63,756	116,670	178,036	198,489	600,646	859,396	365,989	2,702,751
Africa:														
Belgian Congo	.....	.....	.....	.....	.....	.....	34	.....	.....	.....	7,893	1,896	13,651	23,474
British:														
West	.....	.....	56	465	5,743	6,537	20,311	64,938	49,077	29,807	141,902	348,473	148,219	724,528
South	3,000	14,655	29,123	62,304	157,246	100,240	286,401	422,200	811,323	195,714	878,723	1,625,438	425,935	4,754,962
East	.....	2,473	851	1,444	3,203	3,929	11,371	9,599	23,290	4,570	35,158	52,461	37,266	186,596
Canary Islands	.....	76	13	879	1,505	1,939	2,111	3,261	1,300	645	1,018	66,738	38,487	118,025
French Africa	.....	.....	327	73	200	2,660	2,458	2,316	7,163	18,146	64,201	117,272	63,141	278,296
Kamerun, etc.	.....	.....	.....	.....	999	522	21,098	.....	.....	.....	1,820	7,609	6,998	39,046
Liberia	.....	.....	.....	.....	.....	13	.....	33	106	.....	66	100	.....	318
Madagascar	.....	.....	.....	.....	.....	.....	.....	4	175	40	.....	686	1,135	2,040
Morocco	.....	.....	.....	.....	166	3,386	9,928	2,431	7,347	1,350	48,455	39,104	52,400	164,567
Portuguese Africa	.....	47	910	1,222	1,585	3,431	7,064	5,339	1,160	703	2,529	44,085	10,423	78,725
Spanish Africa	.....	.....	.....	.....	.....	103	.....	.....	.....	.....	.....	351	335	789
Other Countries	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	328,359	.....	328,359
Egypt	110	277	99	295	130	1,494	4,751	2,623	716	.....	27,886	104,582	129,367	272,889

*Included in totals of exports to England. †Included in totals of Exports to Jamaica. ‡Previous to 1918 listed as British, French, German and Japanese China. Grand Total $296,098,557

Passenger Car Exports

Country	1907	1910	1912	1913	1914	1915	1916	1917	1918	July 1 to Dec. 31 1918	1919	1920	1921	Total
Austria (Prior 1920 A.-Hungary)	8	25	100	134	314	4	.....	.....	.....	.....	12	13	21	693
	$16,611	$26,178	$78,748	$91,781	$190,199	$2,310	.....	.....	.....	.....	$15,000	$7,927	$11,647	$508,508
Azores & Madeira Is.	.....	2	13	16	20	18	6	1	.....	.....	25	12	4	118
	.....	$2,006	$7,866	$10,549	$10,771	$10,119	$2,272	$700	.....	.....	$12,078	$11,519	$3,135	$72,280
Belgium	35	58	122	94	244	12	.....	.....	.....	.....	1,628	2,450	533	5,337
	$58,859	$147,375	$140,585	$85,679	$139,681	$15,191	.....	.....	.....	.....	$1,784,133	$2,888,057	$379,193	$5,963,262
Bulgaria	.....	2	28	17	43	.....	.....	.....	.....	.....	1	17	12	129
	.....	$1,890	$19,716	$11,457	$21,679	.....	.....	.....	.....	.....	$3,220	$21,105	$5,995	$91,592
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$1,040	$1,040
Denmark	40	46	51	81	263	219	806	1,215	2	96	2,519	1,099	119	6,668
	$30,464	$46,024	$41,976	$77,149	$176,947	$156,296	$548,971	$932,768	$4,100	$155,416	$2,961,948	$1,349,134	$159,586	$6,719,812
Esthonia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$2,106	$2,106
Finland	.....	.....	24	51	106	17	.....	.....	.....	.....	187	82	33	514
	.....	.....	$26,203	$53,568	$83,835	$9,163	.....	.....	.....	.....	$254,378	$124,859	$44,250	$608,305
France	111	246	574	818	1,427	451	2,087	1,367	1,169	495	866	582	153	11,048
	$489,047	$771,869	$469,721	$615,086	$919,060	$252,909	$1,428,325	$836,557	$1,518,858	$331,144	$1,999,773	$933,234	$359,071	$12,710,873
Germany	66	100	288	845	1,411	16	.....	.....	.....	.....	.....	37	22	2,997
	$141,371	$265,218	$226,227	$764,389	$1,040,787	$17,364	.....	.....	.....	.....	.....	$72,319	$45,538	$3,091,135
Gibraltar	1	.....	1	7	64	9	15	9	.....	.....	34	86	8	237
	$2,500	.....	$1,673	$6,576	$33,030	$6,077	$16,165	$11,518	.....	.....	$27,493	$86,276	$10,653	$212,174
Greece	.....	.....	14	5	25	36	124	78	4	.....	269	686	122	1,368
	.....	.....	$9,355	$4,080	$28,256	$28,431	$118,398	$79,913	$6,580	.....	$407,822	$876,740	$130,048	$1,693,494
Hungary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$3,500	.....	$3,500
celand & Faroe Is.	.....	.....	.....	2	5	3	.....	11	15	25	74	31	7	173
	.....	.....	.....	$1,016	$2,488	$2,128	.....	$5,134	$11,396	$22,666	$58,526	$30,553	$8,450	$142,357
Italy	93	93	211	331	342	114	382	186	129	21	26	604	29	2,832
	$249,192	$333,193	$193,037	$280,961	$241,466	$70,265	$217,240	$126,432	$78,228	$32,345	$59,531	$682,263	$43,321	$3,280,139
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$1,200	$1,200
Malta, Gozo & Cyprus, etc.	.....	.....	1	.....	1	.....	.....	.....	.....	.....	29	146	59	236
	.....	.....	$500	.....	$422	.....	.....	.....	.....	.....	$19,065	$129,504	$40,603	$190,094
Netherlands	19	33	103	111	141	96	439	485	.....	.....	1,160	3,103	398	6,148
	$49,146	$76,957	$78,363	$94,163	$117,131	$131,801	$399,017	$612,495	.....	.....	$1,387,680	$3,616,862	$427,776	$7,139,851
Norway	1	22	78	78	145	125	732	922	97	187	1,835	3,200	55	7,504
	$330	$20,669	$66,897	$66,689	$118,338	$89,357	$592,560	$944,002	$115,810	$398,266	$2,355,339	$4,025,685	$67,500	$8,889,080
Poland & Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	232	107	339
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$237,139	$92,278	$329,417
Portugal	.....	9	15	73	59	14	204	283	223	26	320	540	18	1,812
	.....	$11,429	$14,752	$58,931	$65,545	$18,255	$198,975	$271,421	$270,987	$38,228	$405,880	$843,837	$40,331	$2,266,804
Roumania	.....	.....	31	38	28	.....	2	.....	.....	.....	310	173	124	755
	.....	.....	$22,543	$30,337	$17,018	.....	$3,000	.....	.....	.....	$277,884	$150,634	$132,265	$670,428
Russia in Europe	32	97	261	580	926	907	1,268	780	492	6	17	101	14	5,731
	$27,638	$107,310	$254,047	$484,913	$898,458	$1,527,768	$3,142,616	$943,003	$1,136,400	$6,605	$8,426	$68,449	$19,564	$8,880,336
Serbia & Montenegro	.....	.....	4	2	4	2	3	.....	.....	.....	.....	.....	.....	16
	.....	.....	$2,520	$1,160	$2,843	$2,950	$4,200	.....	.....	.....	.....	.....	.....	$14,325
Spain	10	12	174	186	83	71	364	1,125	1,205	459	1,458	3,796	422	9,442
	$10,640	$18,330	$116,202	$127,621	$64,758	$59,555	$299,367	$1,195,887	$1,346,826	$610,844	$1,759,606	$5,576,482	$738,030	$11,991,663
Sweden	53	45	169	256	324	137	238	390	95	1	1,546	5,398	920	9,674
	$63,051	$55,118	$127,729	$235,918	$253,588	$108,652	$180,869	$360,554	$111,377	$2,800	$2,021,948	$6,766,770	$1,039,275	$11,454,648
Switzerland	1	.....	12	22	79	2	6	9	3	1	428	1,413	275	2,265
	$750	.....	$7,873	$24,965	$56,838	$1,244	$4,499	$9,248	$1,533	$1,646	$472,549	$1,781,968	$409,619	$2,784,236
Turkey in Europe	1	.....	22	13	35	.....	.....	.....	.....	.....	68	593	57	801
	$2,000	.....	$13,886	$9,814	$21,052	.....	.....	.....	.....	.....	$52,504	$544,984	$54,106	$708,082
England	.....	1,258	5,660	3,783	6,992	8,321	9,810	1,268	742	88	5,150	18,732	853	65,469
	.....	$2,391,984	$4,403,361	$2,893,785	$5,615,487	$6,849,145	$6,933,806	$1,444,346	$1,712,672	$134,102	$5,573,843	$20,964,717	$793,644	$63,618,540
Scotland	739**	12	22	6	25	143	158	4	150	.....	25	540	6	2,603
	$1,414,056**	$18,109	$28,901	$8,104	$46,948	$82,708	$124,138	$2,991	$217,000	.....	$34,633	$617,257	$5,025	$4,250,264
Ireland	.....	1	34	6	2	159	60	.....	.....	.....	914	902	28	2,120
	.....	$5,500	$22,186	$5,538	$1,593	$157,091	$55,014	.....	.....	.....	$897,065	$1,023,255	$21,349	$2,205,441
Jugoslavia & Albania***	**Includes England, Ireland and Scotland.							.....	.....	.....	.....	11	35	46
	Jugoslavia and Albania** * Previous to 1920 classed with Servia and Montenegro.							.....	.....	.....	.....	$10,431	$29,119	$39,550
Bermuda	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$1,800
British Honduras	3	.....	.....	1	4	1	.....	12	8	6	25	20	14	95
	$4,020	.....	.....	$1,800	$3,929	550	.....	$5,774	$6,858	$4,650	$15,598	$13,593	$9,988	$69,260
Canada	611	3,102	6,288	6,723	4,377	4,127	10,017	14,421	12,985	1,625	8,826	8,047	5,242	92,693
	$969,385	$3,340,326	$7,560,655	$8,229,324	$5,445,052	$3,723,125	$6,555,334	$11,143,740	$10,189,865	$1,461,776	$9,393,009	$10,872,591	$7,186,865	$93,276,607
Costa Rica	.....	2	13	13	20	9	60	37	199	.....	20	98	20	510
	.....	$1,823	$12,603	$14,955	$17,877	$3,897	$28,325	$23,125	$85,070	.....	$19,470	$116,291	$28,254	$368,839
Guatemala	4	16	19	10	26	10	24	35	34	2	125	185	71	606
	$2,743	$22,094	$38,109	$14,892	$36,763	$12,012	$23,552	$36,174	$46,657	$1,815	$151,667	$254,551	$102,141	$800,371
Honduras	.....	.....	3	4	4	31	34	42	16	6	22	44	35	243
	.....	.....	$7,114	$8,100	$3,286	$20,422	$22,652	$24,564	$12,292	$11,093	$14,549	$42,248	$39,663	$206,475
Nicaragua	3	.....	.....	.....	.....	.....	6	5	49	28	71	157	9	328
	$2,050	.....	.....	.....	.....	.....	$3,109	$2,120	$32,031	$28,991	$61,923	$170,165	$11,044	$311,433
Panama	2	13	20	39	58	110	228	356	129	13	173	316	267	1,754
	$1,170	$13,289	$14,271	$43,432	$51,906	$85,990	$170,964	$216,711	$93,329	$13,864	$164,698	$323,929	$277,193	$1,503,937
Salvador	.....	3	6	11	10	16	68	75	54	32	86	191	16	576
	.....	$5,565	$10,658	$13,212	$13,323	$8,888	$54,598	$62,314	$68,297	$36,884	$124,996	$287,088	$24,007	$735,139
Greenland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexico	465	245	273	235	155	70	383	2,807	2,578	770	2,850	4,089	6,750	22,464
	$681,086	$459,077	$418,599	$423,123	$239,166	$66,830	$309,200	$1,642,011	$1,653,545	$793,614	$2,360,346	$3,525,210	$5,183,791	$19,006,558
Miquelon & Langely, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newfoundland & Labrador	3	15	14	9	5	17	21	48	27	68	138	102	9	494
	$9,828	$18,285	$13,812	$10,353	$2,761	$11,681	$15,632	$38,910	$34,676	$72,887	$160,414	$148,518	$16,577	$576,153
Barbados x	Includes Barbados, Jamaica, Trinidad and Tobago for 1909-1910.		16	7	14	19	63	121	58	4	76	144	57	601
			$11,310	$5,973	$12,320	$8,699	$30,688	$62,364	$33,198	$3,300	$56,797	$118,663	$43,799	$409,642
Jamaica x			53	62	66	80	273	335	236	43	121	421	221	1,969
			$52,659	$59,131	$61,475	$61,622	$205,239	$202,375	$149,673	$39,701	$116,425	$401,789	$165,013	$1,596,470
Trinidad & Tobago x	.....	.....	31	43	47	59	128	204	161	19	182	450	124	1,455
	.....	.....	$31,343	$39,902	$49,079	$40,281	$87,167	$112,014	$100,571	$18,474	$137,564	$414,674	$97,929	$1,136,323
Other British West Indies x	35	102	4	7	13	38	100	124	80	24	53	153	85	892
	$56,059	$157,459	$1,960	$6,716	$11,061	$18,463	$51,612	$80,879	$50,009	$15,603	$35,966	$127,046	$62,199	$803,962
Cuba	67	120	202	223	297	1,359	3,698	3,529	2,975	871	2,887	6,293	1,692	24,549
	$129,226	$187,392	$234,569	$242,686	$254,428	$745,695	$2,091,295	$2,545,071	$3,029,813	$1,295,485	$3,121,228	$7,096,895	$1,428,162	$22,908,146
Virgin Is. of U. S.	.....	.....	5	4	3	3	9	18	23	13	27	66	45	217
	.....	.....	$3,303	$2,131	$2,954	$1,375	$3,426	$9,114	$12,313	$9,194	$20,010	$46,925	$27,359	$138,827
Dutch W. Indies	.....	.....	3	19	13	24	21	32	12	2	13	69	39	249
	.....	.....	$1,647	$14,590	$9,605	$16,829	$10,945	$19,191	$7,435	$1,295	$7,369	$67,376	$21,059	$178,917
French W. Indies	.....	.....	.....	5	65	54	101	293	248	25	156	148	22	1,118
	.....	.....	.....	$3,877	$48,377	$34,906	$63,670	$154,990	$146,698	$21,561	$137,929	$129,713	$20,647	$763,368
Haiti	.....	1	2	38	2	.....	10	29	102	22	179	202	36	623
	.....	$1,510	$910	$24,499	$1,485	.....	$3,788	$13,780	$54,613	$18,408	$158,594	$171,293	$26,173	$475,053
Dominican Republic	1	1	13	7	11	28	131	191	248	99	173	593	102	1,623
	$1,650	$4,000	$12,739	$5,382	$15,195	$14,609	$60,127	$96,173	$157,607	$87,290	$174,204	$577,560	$85,848	$1,315,795
Argentina	39	268	727	1,062	940	626	4,399	3,924	3,525	559	2,202	4,597	613	24,003
	$58,070	$174,677	$860,350	$1,181,735	$963,586	$294,129	$2,065,439	$2,336,001	$2,666,898	$708,853	$2,711,232	$5,828,057	$850,991	$21,277,221
Bolivia	2	.....	.....	2	4	10	26	141	152	14	24	4	4	383
	$1,550	.....	.....	$1,493	$12,764	$5,462	$16,208	$100,151	$105,408	$8,548	$13,846	$39,639	$17,036	$322,105

from 1907 to 1921

Country	1907	1910	1912	1913	1914	1915	1916	1917	1918	July 1 to Dec. 31 1918	1919	1920	1921	Total
Brazil	52 $57,037	64 $67,687	554 $662,883	987 $1,035,247	299 $264,992	81 $52,939	272 $157,968	873 $523,383	1,575 $1,000,011	442 $424,317	3,273 $2,580,304	6,251 $6,761,382	285 $418,834	15,268 $14,356,322
Chile	44 $52,905	3 $1,824	30 $39,873	78 $109,982	195 $160,194	120 $64,327	826 $530,211	2,587 $1,821,842	3,399 $3,576,511	673 $1,009,964	454 $700,997	797 $992,539	99 $142,288	9,338 $9,249,204
Colombia	....	12 $22,482	42 $35,386	110 $113,334	9 $69,620	39 $34,956	91 $58,525	173 $118,937	164 $121,422	30 $27,542	253 $298,383	962 $1,247,976	122 $144,751	2,093 $2,309,369
Ecuador	....	2 $2,168	21 $20,578	74 $55,372	21 $21,229	20 $11,233	62 $44,396	137 $106,478	142 $130,086	22 $29,471	84 $111,051	201 $288,884	28 $39,461	822 $866,455
Falkland Is.	....	....	....	....	....	....	....	....	....	....	4 $5,788	....	....	4 $5,788
British Guiana	....	4 $5,952	20 $17,306	18 $14,313	16 $11,364	45 $24,311	73 $33,933	146 $65,989	180 $100,546	18 $18,472	49 $39,369	130 $92,665	10 $8,498	717 $439,006
Dutch Guiana	....	....	....	....	7 $3,948	9 $4,492	15 $7,181	23 $11,797	16 $17,775	....	7 $3,872	10 $12,706	11 $8,260	98 $70,031
French Guiana	....	....	1 $580	1 $558	....	....	1 $1,000	1 $498	8 $3,632	1 $318	3 $2,167	3 $5,264	1 $1,000	20 $15,017
Paraguay	5 $2,394	1 $1,200	....	....	....	5 $2,308	6 $2,256	40 $20,192	13 $5,025	....	13 $5,780	102 $64,967	1 $1,200	187 $105,879
Peru	8 $6,428	4 $5,004	13 $10,833	70 $55,646	36 $31,362	24 $20,658	59 $40,388	400 $295,558	784 $913,669	257 $395,253	599 $662,528	1,297 $1,249,546	76 $185,362	3,641 $3,886,878
Uruguay	1 $625	20 $23,666	177 $235,097	209 $273,253	183 $167,269	45 $25,706	285 $150,540	1,165 $612,838	2,232 $1,177,463	418 $307,221	1,844 $1,757,623	4,090 $4,055,458	164 $297,382	10,941 $9,250,082
Venezuela	1 $1,000	....	26 $28,180	104 $109,499	126 $102,073	227 $143,086	518 $314,156	542 $327,507	160 $97,485	38 $56,021	293 $300,888	883 $821,490	275 $273,425	3,193 $2,574,810
Aden	....	....	....	15 $7,998	28 $20,990	9 $6,706	16 $9,166	10 $7,968	8 $6,879	....	29 $25,197	52 $50,387	12 $10,518	180 $146,597
China	16 $15,255	8 $13,785	78 $98,730	89 $90,459	144 $143,619	122 $119,635	264 $191,932	509 $383,371	833 $818,659	409 $402,275	1,158 $1,414,844	1,774 $2,356,699	499 $532,803	5,956 $6,633,167
Armenia, etc.	....	....	....	....	....	....	....	....	....	....	....	....	12 $4,519	12 $4,519
China, British China, French China, German (Kwantung) Japanese	.... Listed separa	.... tely prior t 1	.... o 1918, as 1	.... Kwantung	.... thereafter.	....	....	..... 20 $9,325	6 3,000 $2,017	....	....	62 $68,491	6 $19,807	74 $91,298 22 $11,342 .....
	....	$5,100	$850	....	....	....	....	33 $17,796	10 $7,321	38 $29,335	36 $28,995	....	....	119 $89,397
Chosen	....	1 $10,270	....	7 $6,095	2 $1,795	2 $1,800	7 $4,780	5 $3,832	2 $1,300	3 $2,295	11 $9,272	595 $311,457	4 $1,871	642 $358,075
Britfsh India	45 $26,067	26 $22,372	253 $203,740	439 $355,573	437 $379,954	315 $274,680	2,289 $1,638,262	3,603 $2,644,085	73 $53,428	27 $42,756	2,624 $2,891,943	12,014 $13,865,679	820 $909,609	23,133 $23,453,859
Straits Settlements	9 $4,754	21 $20,955	120 $86,668	387 $319,247	262 $216,659	77 $70,210	376 $239,715	855 $585,820	287 $202,221	49 $53,934	499 $572,320	2,334 $2,638,794	105 $149,013	5,447 $5,213,926
Other British East Indies	....	4 $2,875	25 $20,882	39 $31,245	82 $73,175	25 $20,208	239 $168,685	110 $80,033	11 $17,740	....	102 $114,609	490 $540,146	41 $96,251	1,182 $1,175,764
Dutch East Indies	67 $36,629	33 $21,768	120 $70,055	278 $198,378	290 $208,722	105 $87,306	1,064 $753,128	3,206 $2,642,330	1,272 $1,302,800	1,078 $1,359,811	1,820 $2,369,241	4,765 $6,500,062	675 $1,061,059	14,985 $16,766,366
French Indo China	....	....	....	....	....	....	8 $3,033	18 $17,967	18 $21,175	12 $18,069	37 $43,918	537 $568,961	32 $40,258	662 $713,381
Greece in Asia	....	....	....	....	....	....	....	....	....	....	....	....	9 $6,502	9 $6,502
Portuguese E. Indies	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hongkong	9 $7,372	2 $3,788	4 $2,740	7 $6,673	11 $13,043	2 $1,475	15 $10,858	38 $35,255	117 $91,228	86 $86,006	144 $188,121	214 $341,191	76 $125,143	730 $916,210
Japan	15 $19,242	12 $26,759	118 $143,619	312 $364,507	96 $100,995	28 $29,210	153 $120,061	652 $481,748	2,139 $2,040,897	1,514 $1,608,516	2,805 $2,890,034	2,796 $2,983,137	1,281 $983,542	11,995 $11,873,426
Hejaz, Mesopotamia, etc.	....	....	....	....	....	....	....	....	....	....	....	....	69 $34,964	69 $34,964
Persia	....	....	....	....	....	....	....	....	2 $1,048	8 $4,625	4 $2,275	134 $76,718	37 $18,923	185 $103,589
Russia in Asia	2 $1,884	3 $1,760	....	1 $1,160	12 $14,998	551 $1,477,809	683 $529,385	1,072 $1,324,060	5 $8,425	3 $11,734	49 $52,145	76 $124,235	....	2,457 $3,547,595
Siam	4 $1,569	4 $6,407	13 $8,933	56 $35,934	37 $26,219	13 $10,317	41 $32,082	31 $15,915	65 $60,220	27 $22,005	71 $70,210	82 $92,457	63 $73,498	518 $465,265
Turkey in Asia	....	1 $1,200	1 $650	1 $824	7 $5,662	1 $1,000	....	....	....	6 $3,965	119 $116,347	1,214 $930,661	377 $277,746	1,731 $1,346,607
Other Asia	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Australia	62 $57,731	437 $268,274	2,597 $2,260,320	2,083 $1,896,990	3,099 $2,615,896	2,169 $1,768,479	5,335 $4,147,302	5,055 $3,792,571	4,307 $3,410,557	1,582 $1,492,899	3,905 $4,016,751	8,882 $9,936,869	3,020 $3,065,909	43,793 $39,760,261
New Zealand	69 $120,533	77 $55,236	953 $946,736	958 $990,837	1,065 $974,708	938 $784,206	2,672 $2,055,843	3,554 $2,558,118	1,818 $1,453,311	639 $607,807	2,959 $3,314,891	6,671 $8,190,277	691 $875,552	23,596 $23,425,977
Other British Oceania	....	....	75 $73,932	3 $2,396	9 $6,014	2 $2,081	28 $18,227	19 $11,062	30 $20,863	7 $5,955	23 $17,264	32 $34,670	11 $11,018	257 $227,896
French Oceania	....	1 $900	3 $2,920	11 $14,005	46 $45,184	8 $7,482	92 $56,789	22 $12,330	12 $7,612	3 $3,368	11 $11,118	13 $14,255	10 $10,643	232 $186,606
Other Oceania	....	....	....	1 $350	....	1 $5,000	7 $3,208	12 $5,847	12 $11,029	7 $4,935	8 $6,285	22 $16,165	14 $10,245	84 $63,064
Philippine Is.	2 $1,205	130 $175,626	401 $557,368	517 $577,040	614 $697,175	407 $425,001	861 $859,450	1,019 $686,731	1,714 $1,373,204	603 $616,437	2,381 $2,629,348	3,452 $3,932,108	467 $476,484	12,917 $13,432,035
Abyssinia	....	....	....	....	....	....	....	....	....	....	....	5	....	5 .....
Belgian Congo	....	....	....	....	....	....	....	....	....	....	....	$2,416 24	 15	$2,416 39
British W. Africa	....	....	....	4 $2,688	32 $18,319	42 $20,899	63 -$35,361	240 $144,838	202 $115,772	43 $37,351	357 $393,405	$16,325 753	$9,198 73	$25,523 1,809
British S. Africa	2 $1,817	75 $61,185	331 $306,606	1,279 $1,157,895	1,618 $1,437,883	695 $731,278	2,859 $2,040,977	3,423 $2,378,380	2,142 $1,706,136	541 $530,951	3,019 $3,462,330	6,688 $7,795,194	596 $687,738	23,431 $22,448,403
British E. Africa	....	11 $10,463	22 $14,998	14 $12,802	49 $34,430	120 $75,188	237 $137,245	94 $55,681	112 $75,778	14 $14,445	82 $80,954	373 $432,819	112 $133,866	1,247 $1,085,582
Canary Is.	....	1 $850	3 $2,066	10 $6,426	15 $6,956	27 $12,015	51 $32,935	31 $24,525	15 $5,378	....	6 $10,162	150 $196,216	67 $55,077	379 $355,836
French Africa	1 $950	11 $18,188	30 $20,164	10 $7,297	19 $17,273	....	2 $1,155	41 $13,315	121 $50,550	89 $52,757	198 $144,023	369 $301,720	94 $69,718	1,010 $718,935
Kamerun, etc.	....	....	....	5 $3,175	19 $14,136	7 $4,865	20 $7,760	....	....	....	7 $3,721	44 $27,976	6 $4,690	108 $66,323
Italian Africa	....	....	....	....	....	....	....	3 $1,200	....	....	....	5 $3,075	....	8 $4,275
Liberia	....	....	....	1 $805	....	....	....	1 $975	12 $4,220	....	....	1 $1,205	....	15 $7,205
Madagascar	....	....	....	....	....	....	7 $2,532	1 $808	2 $1,659	....	....	3 $3,000	....	13 $7,999
Morocco	....	....	....	....	63 $29,497	25 $10,847	52 $20,574	87 $39,670	35 $17,718	....	237 $162,016	364 $340,490	80 $61,485	943 $682,297
Portuguese Africa	1 $2,110	7 $5,302	16 $13,096	20 $16,102	24 $21,563	6 $7,301	56 $38,510	7 $5,429	9 $9,673	12 $8,598	18 $16,636	244 $282,203	31 $23,562	454 $452,754
Spanish Africa	....	....	....	....	....	....	....	....	....	....	....	....	2 $6,950	2 $6,950
Egypt	2 $887	1 $998	5 $2,872	16 $10,156	22 $11,437	1 $695	25 $18,352	38 $22,113	21 $17,300	6 $20,850	230 $165,244	1,558 $1,553,898	212 $135,365	2,143 $1,975,064
Totals	2,862 $4,890,886	6,926 $9,548,700	21,757 $21,550,139	24,293 $24,275,796	28,306 $25,392,963	23,880 $21,113,953	56,234 $40,660,263	64,808 $48,612,632	52,312 $45,331,366	14,345 $15,698,106	67,145 $73,700,527	142,508 $165,255,921	30,959 $32,583,675	553,799 $551,844,708

Truck Exports

Country	1913	1914	1915	1916	1917	1918	July 1 to Dec. 31, 1918	1919	1920	1921	Total
Austria	2 $3,595	3 $7,455						10 $18,500	3 $1,348	1 $520	19 $31,418
Azores and Madeira Islands								3 $3,816	1 $3,650	3 $1,369	7 $8,835
Belgium			100 $365,000					138 $307,778	195 $209,985	169 $77,756	602 $960,519
Bulgaria	2 $1,528								4 $9,723		6 $11,251
Denmark	3 $2,120		44 $25,033	41 $36,413	58 $81,414	2 $3,800		643 $1,339,380	296 $615,448	18 $33,375	1,105 $2,136,983
Finland								10 $12,783	104 $212,594	6 $6,000	120 $231,377
France	6 $10,709	2 $5,070	4,990 $13,523,843	5,681 $17,709,579	4,264 $13,854,903	2,754 $10,001,626	2,025 $8,011,335	3,521 $15,143,226	135 $434,943	10 $14,991	23,388 $78,710,225
Germany	4 $4,029	24 $18,462	4 $2,800						47 $41,958	1 $535	80 $67,784
Gibraltar						27 $58,325			3 $4,756		30 $63,081
Greece	1 $1,176	1 $1,800	148 $426,570	45 $98,815	3 $2,000	14 $32,000		37 $80,891	71 $110,773	26 $28,846	340 $782,871
Hungary									1 $3,164		1 $3,164
Iceland and Faroe Islands						1 $2,245		26 $21,661	38 $22,321		65 $46,227
Italy	1 $1,229	1 $8,000	6 $14,655	65 $159,775	52 $28,055	26 $87,577	7 $24,310	37 $67,775	2 $899		196 $392,275
Malta, Gozo and Cypress								9 $11,557	4 $1,666		13 $13,223
Netherlands	2 $4,489	1 $1,452	9 $19,069	50 $93,797	36 $55,305			122 $294,772	528 $593,491	300 $207,932	1,048 $1,270,307
Norway	2 $2,200	2 $3,852	3 $4,689	81 $121,480	162 $226,741	40 $133,227	83 $212,574	815 $1,787,473	829 $1,434,715	20 $28,461	2,037 $3,955,412
Poland and Danzig									22 $35,473	28 $61,368	50 $96,841
Portugal	1 $1,400	8 $12,075	5 $10,291	295 $1,117,681	21 $45,087	12 $36,914	10 $42,300	30 $76,728	156 $284,197	1 $3,650	539 $1,630,323
Roumania	12 $12,000							114 $94,951	75 $89,370	15 $25,102	216 $221,423
Russia in Europe	13 $34,163	2 $5,322	2,251 $7,666,883	3,909 $12,544,258	1,733 $5,428,979	406 $1,562,303		2 $2,503	104 $59,535	32 $25,100	8,452 $27,329,046
Serbia and Montenegro			10 $6,300	20 $65,000				4 $5,700			34 $77,000
Spain	1 $1,400		1 $1,800	30 $57,277	29 $55,808	46 $97,910	33 $87,180	209 $409,493	567 $1,004,833	27 $49,592	943 $1,765,293
Sweden	1 $900	10 $17,600	19 $29,050	6 $10,879	7 $10,360			211 $444,695	821 $1,416,124	64 $133,690	1,139 $2,063,298
Switzerland								33 $40,044	78 $49,767	9 $14,929	120 $104,740
Turkey in Europe	1 $2,000	2 $8,009						82 $118,005	120 $165,400	5 $16,715	210 $310,129
Ukraine										1 $600	1 $600
England	184 $119,468	203 $189,099	5,306 $14,042,325	8,268 $18,723,403	6,525 $17,061,105	4,085 $13,438,981	830 $2,456,993	890 $1,342,575	4,995 $7,148,880	272 $423,020	32,278 $74,945,849
Scotland			4 $11,250	224 $271,745		447 $1,203,328		2 $1,779	162 $183,955	5 $7,290	844 $1,679,347
Ireland			1 $7,033	8 $39,776			2 $4,276	15 $19,948	45 $40,555		71 $111,588
Yugoslavia and Albania									3 $1,511	2 $1,430	5 $2,941
Bermuda										2 $4,571	2 $4,571
British Honduras						2 $3,700	1 $834		20 $14,442	2 $709	25 $19,685
Canada	489 $1,004,237	247 $474,724	306 $705,213	387 724,827	636 $945,047	1,108 $1,381,542	895 $1,192,833	1,858 $2,896,325	2,149 $4,187,597	1,144 $1,795,129	9,819 $15,307,464
Costa Rica	2 $3,463	8 $10,571	2 $4,165		1 $900	5 $10,245		1 $504	14 $22,553	13 $24,920	46 $77,321
Guatemala				2 $4,916	4 $4,323	3 $5,512		10 $16,761	25 $38,105	7 $5,920	51 $75,537
Honduras	1 $3,000		6 $12,500	6 $14,540	4 $4,094	6 $3,373		7 $9,589	19 $20,770	6 $15,555	55 $83,421
Nicaragua				1 $2,500		2 $2,509	1 $5,742	11 $16,026	23 $32,253	5 $14,200	43 $73,230
Panama	5 $7,243	6 $12,010	32 $55,171	75 $97,970	47 $47,859	16 $20,504	33 $30,148	68 $56,127	71 $98,790	353 $425,822	
Salvador			1 $1,300	1 $868	4 $14,811	1 $175	4 $8,897	42 $118,585	1 $3,166	54 $147,802	
Greenland											
Mexico	35 $83,363	12 $17,509	8 $14,492	51 $100,500	218 $198,151	365 $525,664	201 $260,968	938 $1,205,664	1,281 $1,973,994	1,482 $1,554,554	4,591 $5,934,859
Miquelon, Langley, Etc.								6 $6,000			6 $6,000
Newfoundland and Labrador	4 $8,845	1 $1,221	1 $750	1 $1,692	1 $2,675	2 $7,250	5 $2,997	10 $23,306	12 $54,907	3 $6,275	40 $109,918
Barbados					1 $1,506	2 $3,400	5 $11,792	15 $14,394	58 $52,148	3 $1,800	84 $85,040
Jamaica	4 $9,234	3 $9,250	3 $7,292	9 $18,524	6 8,285	10 $6,775	2 $800	36 $42,828	215 $313,578	43 $51,469	331 $468,035
Trinidad and Tabago	1 $2,000			2 $1,974	2 $5,722	14 $18,361	7 $15,089	69 $86,479	202 $271,451	68 $61,630	1365 $462,706
Other British West Indies				6 $11,327	1 $500	28 $89,914	4 $3,304	25 $14,301	56 $38,168	22 $17,626	142 $175,140
Cuba	14 $23,639	19 $33,500	21 $34,607	117 $176,647	397 $722,519	554 $1,130,982	279 $539,070	915 $1,955,509	1,953 $4,937,281	283 $366,710	4,552 $9,920,464
Virgin Islands of United States	1 $4,250					2 $2,845		1 $3,350	8 $16,789	7 $5,701	19 $32,935
Dutch West Indies		1 $595	1 $1,463		2 $2,095			3 $3,095	18 $8,542	6 $3,720	31 $19,510
French West Indies			2 $3,975	1 $2,310	7 $13,305	26 $49,626	2 $3,650	58 $77,085	71 $55,607	13 $7,940	180 $213,498
Haiti	3 $5,553				2 $1,324	11 $10,578	2 $1,200	8 $6,798	27 $51,358	14 $6,281	67 $83,092
Dominican Republic	1 $1,858	1 $1,800	2 $3,372	4 $5,173	22 $23,640	21 $13,323	8 $11,597	48 $75,953	213 $226,982	18 $52,473	338 $416,171
Argentina	35 $78,000	48 $65,225	3 $2,910	45 $33,063	141 $146,255	51 $50,124	3 $4,094	145 $291,430	352 $825,333	24 $70,111	847 $1,566,545

from 1913 to 1921

Country	1913	1914	1915	1916	1917	1918	July 1 to Dec. 31, 1918	1919	1920	1921	Total
Bolivia	.....	.....	.....	.....	*20*	*14*	*12*	*8*	*13*	.....	*67*
	.....	.....	.....	.....	$48,590	$24,958	$38,716	$12,376	$21,895	.....	$146,535
Brazil	*38*	*13*	*3*	*11*	*14*	*24*	*21*	*200*	*1,640*	*103*	*1,965*
	$75,073	$20,449	$2,861	$19,635	$8,300	$31,133	$19,167	$199,738	$1,191,577	$354,810	$1,922,743
Chili	.....	*2*	.....	*17*	*69*	*220*	*85*	*88*	*299*	*45*	*825*
	.....	$10,743	.....	46,566	$160,696	$282,638	$136,376	$131,055	$326,216	$64,636	$1,158,926
Colombia	*3*	.....	*1*	*4*	*2*	*3*	*2*	*38*	*275*	*35*	*363*
	$6,112	.....	$1,237	$1,236	$4,998	$7,100	$3,285	$39,341	$291,410	$66,440	$421,159
Ecuador	*1*	.....	.....	*2*	*1*	*3*	*4*	*5*	*46*	*20*	*82*
	$2,017	.....	.....	$3,378	$2,050	$6,876	6,520	6,865	$85,805	$41,818	$155,419
Falkland Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	*1*	*1*
	.....	.....	.....	.....	.....	.....	.....	.....	.....	$545	$545
British Guiana	.....	.....	*1*	.....	*1*	*7*	*1*	*35*	*123*	*5*	*173*
	.....	.....	$900	.....	$1,529	$5,100	$2,600	$24,119	$72,966	$7,686	$114,900
Dutch Guiana	.....	.....	.....	*1*	.....	.....	*1*	*1*	*6*	.....	*9*
	.....	.....	.....	$1,037	.....	.....	$1,000	$506	$4,111	.....	$6,654
French Guiana	.....	.....	.....	.....	.....	.....	.....	*4*	*1*	.....	*5*
	.....	.....	.....	.....	.....	.....	.....	$2,061	$3,061	.....	$5,122
Peru	.....	*3*	*2*	*5*	*25*	*73*	*52*	*207*	*900*	*53*	*1,319*
	.....	5,301	$3,484	$5,830	48,776	$155,834	$139,295	$215,175	$775,398	$89,401	$1,438,494
Uruguay	*7*	*1*	.....	*2*	*4*	*16*	*2*	*68*	*113*	*81*	*294*
	$19,280	$865	.....	$5,818	$10,437	$15,809	$2,000	$79,196	$113,479	$32,713	$279,597
Venezuela	*23*	*12*	*3*	*6*	*14*	*16*	*2*	*41*	*186*	*13*	*316*
	$34,291	$28,228	$7,164	$13,029	$28,502	$12,410	$2,200	$24,579	$144,308	$18,911	$313,622
Aden	.....	.....	.....	.....	.....	.....	.....	*1*	*2*	.....	*3*
	.....	.....	.....	.....	.....	.....	.....	$922	$7,188	.....	$8,110
China	.....	*7*	.....	*39*	*9*	*23*	*31*	*273*	*261*	*71*	*714*
	.....	$12,700	.....	$89,799	$14,287	$26,236	$46,595	$596,715	$464,785	$105,485	$1,356,602
China British	.....	.....	.....	.....	.....	.....	.....	*4*	*1*	.....	*5*
	.....	.....	.....	.....	.....	.....	.....	$6,335	$1,763	.....	$8,098
Kwantung	.....	*1*	.....	.....	.....	.....	.....	.....	.....	*13*	*14*
	.....	$2,451	.....	.....	.....	.....	.....	.....	.....	$26,435	$28,886
Chosen	*1*	.....	.....	*3*	.....	*2*	.....	.....	.....	.....	*6*
	$3,500	.....	.....	$5,027	.....	$1,629	.....	.....	.....	.....	$10,156
British India	.....	*7*	*7*	*135*	*126*	*11*	*1*	*260*	*1,612*	*132*	*2,291*
	.....	$12,091	$8,680	$208,067	$205,023	$20,275	$2,118	$563,339	$3,262,328	$269,760	$4,551,681
Straits Settlements	*2*	*7*	.....	*17*	*57*	*70*	*44*	*115*	*447*	*63*	*822*
	$5,588	$14,381	.....	$25,169	$61,881	$113,554	$64,425	$229,624	$857,410	$158,487	$1,530,519
Other British East Indies	.....	.....	*1*	*20*	*26*	*3*	.....	*16*	*69*	*4*	*139*
	.....	.....	$3,300	$27,841	$38,970	$7,138	.....	$27,700	$152,849	$4,192	$261,990
Dutch East Indies	*2*	*7*	*11*	*58*	*108*	*68*	*139*	*324*	*1,188*	*368*	*2,267*
	$4,840	$14,232	$9,567	$82,586	$137,609	$162,749	$313,725	$689,225	$2,920,663	$922,997	$5,258,193
French Indo China	.....	.....	.....	.....	.....	*2*	*3*	*16*	*141*	*8*	*170*
	.....	.....	.....	.....	.....	$3,500	$7,290	$11,556	$117,984	$7,522	$147,852
Greece in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	*2*	*2*
	.....	.....	.....	.....	.....	.....	.....	.....	.....	$734	$734
Hejaz, Arabia, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	*14*	*14*
	.....	.....	.....	.....	.....	.....	.....	.....	.....	$10,663	$10,663
Hongkong	.....	.....	*1*	*3*	.....	*8*	*8*	*19*	*26*	*29*	*94*
	.....	.....	$780	$6,304	.....	$5,371	$10,500	$25,547	$55,377	$80,450	$184,329
Japan	*21*	*1*	*1*	*15*	*70*	*279*	*381*	*1,143*	*1,233*	*781*	*3,925*
	$32,770	$900	$3,382	$14,528	$59,198	$317,787	$636,692	$1,736,439	$1,590,760	$634,867	$5,027,323
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	.....	*11*	*11*
	.....	.....	.....	.....	.....	.....	.....	.....	.....	$11,194	$11,194
Persia	.....	.....	.....	.....	.....	*4*	.....	.....	*20*	.....	*24*
	.....	.....	.....	.....	.....	$2,712	.....	.....	$10,601	.....	$13,313
Russia in Asia	.....	.....	*596*	*1,170*	*515*	.....	*15*	*21*	*9*	.....	*2,326*
	.....	.....	$1,903,221	$3,546,435	$1,662,144	.....	$18,200	$41,482	$18,491	.....	$7,189,973
Siam	.....	.....	.....	*9*	*8*	*6*	*2*	*8*	*5*	.....	*38*
	.....	.....	.....	$7,036	$6,700	$4,535	$4,867	$12,411	$8,965	.....	$44,514
Turkey in Asia	.....	*1*	*5*	.....	*2*	.....	.....	*14*	*93*	*41*	*156*
	.....	$1,354	$26,282	.....	$1,143	.....	.....	$27,695	$126,775	$62,627	$245,876
Australia	*17*	*32*	*57*	*201*	*194*	*109*	*15*	*418*	*986*	*720*	*2,749*
	$23,020	$37,378	$84,142	$205,538	$237,159	$163,405	$26,274	$565,406	$1,439,774	$1,194,900	$4,066,996
New Zealand	*1*	*39*	*20*	*93*	*75*	*74*	*52*	*225*	*522*	*157*	*1,258*
	$1,201	$61,599	$31,575	$149,848	$119,833	$145,764	$59,690	$501,488	$1,156,310	$331,898	$2,559,206
Other British Oceania	.....	.....	.....	*2*	*1*	*2*	.....	*9*	*6*	*1*	*21*
	.....	.....	.....	$2,612	$1,688	$2,401	.....	$9,779	$6,250	$2,168	$24,901
French Oceania	*2*	*4*	.....	*1*	*2*	*5*	*1*	*1*	*4*	.....	*20*
	$3,400	$7,625	.....	$860	$2,750	$6,480	$1,000	$600	$9,858	.....	$32,573
Other Oceania	.....	.....	.....	*1*	*3*	*4*	*2*	*8*	*9*	*1*	*28*
	.....	.....	.....	$1,530	$2,377	$5,518	$2,213	$7,020	$4,706	$500	$23,864
Philippine Islands	*43*	*38*	*27*	*58*	*53*	*163*	*32*	*516*	*1,155*	*234*	*2,319*
	$92,809	$64,805	$62,132	$88,286	$57,457	$215,106	$56,815	$798,540	$1,818,221	$221,650	$3,475,821
Abyssinia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgian Kongo	.....	.....	.....	.....	.....	.....	.....	*3*	*13*	*35*	*51*
	.....	.....	.....	.....	.....	.....	.....	.....	.....	$20,435	$20,435
British West Africa	.....	*1*	.....	*7*	*116*	*27*	*13*	*215*	*780*	*33*	*1,191*
	.....	$1,260	.....	$13,173	$124,574	$20,136	$15,097	$254,830	$1,137,335	$49,109	$1,615,520
British South Africa	*11*	*12*	*15*	*36*	*34*	*70*	*23*	*57*	*244*	*58*	*560*
	$9,476	$11,539	$40,280	$54,519	$82,957	$107,085	$26,750	$102,992	$425,129	$104,544	$965,271
British East Africa	.....	.....	.....	.....	.....	*1*	.....	*6*	*8*	*2*	*17*
	.....	.....	.....	.....	.....	$787	.....	$5,010	$17,338	$6,000	$29,135
Canary Islands	.....	*1*	.....	.....	*1*	.....	.....	*5*	*11*	*18*	*36*
	.....	$1,203	.....	.....	$575	.....	.....	$4,312	$32,311	$16,539	$54,940
French Africa	*1*	.....	.....	.....	.....	*18*	*11*	*44*	*339*	*11*	*424*
	$858	.....	.....	.....	.....	$12,963	$9,217	$47,157	$355,125	$5,632	$430,952
Kamerun, Etc.	.....	.....	.....	.....	.....	.....	.....	*7*	*21*	*5*	*33*
	.....	.....	.....	.....	.....	.....	.....	$3,544	$20,736	$1,944	$26,224
Italian Africa	.....	.....	.....	.....	.....	.....	.....	.....	*5*	.....	*5*
	.....	.....	.....	.....	.....	.....	.....	.....	$11,500	.....	$11,500
Liberia	.....	.....	.....	.....	.....	.....	.....	.....	*2*	.....	*2*
	.....	.....	.....	.....	.....	.....	.....	.....	$1,156	.....	$1,156
Madagascar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morocco	.....	.....	.....	*7*	.....	.....	.....	*13*	*44*	*20*	*84*
	.....	.....	.....	$9,675	.....	.....	.....	$13,410	$24,376	$9,075	$56,536
Portuguese Africa	.....	*1*	.....	*1*	*1*	.....	*4*	*4*	*34*	*12*	*57*
	.....	$2,604	.....	$2,803	$2,500	.....	$7,725	$6,408	$34,950	$9,484	$66,474
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	*1*	.....	*1*
	.....	.....	.....	.....	.....	.....	.....	.....	$2,118	.....	$2,118
Egypt	.....	.....	.....	.....	*4*	.....	.....	*15*	*74*	*44*	*137*
	.....	.....	.....	.....	$9,624	.....	.....	$13,285	$69,492	$40,367	$132,768
Totals	*993*	*784*	*13,996*	*21,265*	*15,977*	*12,200*	*5,401*	*15,585*	*29,136*	*7,501*	*122,838*
	$1,737,141	$1,181,611	$39,140,682	$56,805,548	$42,343,502	$31,874,459	$14,637,236	$35,425,437	$46,775,781	$10,320,704	$280,182,248

American Tractor

	1914	1915	1916	1917	1918	July 1 to Dec 31 1918	Calendar Year 1919	1920	1921	Total for All Years
Europe:										
Austria-Hungary	20 $58,977								1 $730	21 $59,707
Azores, etc.									2 $2,781	2 $2,781
Belgium							232 $191,710	156 $128,830	87 $78,418	475 $398,958
Bulgaria	8 $9,433							26 $27,061	1 $440	35 $36,934
Czechoslavakia									1 $202	1 $202
Denmark			7 $23,905	7 $9,130	1 $2,370	2 $6,800	899 $770,715	192 $170,374	166 $164,990	1,274 $1,148,284
Finland							5 $6,800	29 $67,823	34 $74,623	
France	2 $4,986	25 $100,500	284 $744,240	1,201 $1,259,232	2,157 $2,428,335	555 $1,036,879	4,620 $5,066,823	2,071 $1,691,594	428 $356,674	11,346 $12,689,223
Germany	47 $121,652						35 $22,820	4 $2,812	1 $150	87 $147,434
Greece					94 $95,500	39 $16,800	126 $85,723	36 $40,051	9 $10,717	304 $248,791
Iceland and Faroe Islands							3 $4,550	2 $3,208		5 $7,758
Italy	1 $3,683			135 $125,043	5,406 $4,742,132	2,570 $3,229,190	375 $682,379	53 $81,782	1 $400	8,541 $8,864,609
Netherlands	1 $3,750			4 $7,400			55 $62,295	122 $93,376	37 $36,751	219 $203,572
Norway				39 $58,648	1 $1,093	105 $125,890	139 $139,624	159 $182,891	22 $36,410	464 $544,556
Poland and Danzig								261 $217,737	212 $234,424	473 $452,161
Portugal				1 $495	20 $31,239		39 $52,787	17 $49,589	6 $19,080	83 $153,190
Roumania	23 $55,320						106 $127,178	77 $114,610	5 $13,849	211 $310,957
Russia in Europe	67 $196,617	26 $69,370	44 $84,550	136 $353,666	366 $959,424		7 $9,000	10 $10,200	5 $5,500	661 $1,688,327
Serbia, Montenegro, etc.			20 $27,000				1 $584			21 $27,584
Spain	2 $7,405		1 $1,050	53 $55,169	12 $11,728	8 $11,030	182 $212,985	492 $553,055	220 $179,564	970 $1,031,986
Sweden				6 $5,304			275 $248,134	333 $438,105	322 $357,773	936 $1,049,316
Switzerland					1 $2,339		21 $18,078	1 $1,625	10 $11,005	33 $33,047
Turkey in Europe							20 $28,564	3 $5,021		23 $33,585
Urkaine									1 $710	1 $710
United Kingdom:										
England	80 $343,922	641 $1,843,229	2,926 $4,747,841	8,862 $8,807,131	1,029 $1,524,521	2,088 $1,490,515	977 $916,324	960 $867,772	17,563 $20,541,255	
Scotland	1 $1,562			64 $105,882	9 $52,466	1 $600	31 $24,967	1 $230	107 $185,707	
Ireland			51 $29,325			354 $209,613			405 $238,938	
Jugoslavia							7 $8,622		7 $8,622	
North America:										
British Honduras	1 $298		3 $8,315					2 $3,481	6 $12,094	
Bermuda								2 $1,262	2 $1,262	
Canada	382 $637,162	252 $281,867	680 $693,328	2,909 $3,047,523	5,824 $5,774,288	3,208 $2,628,569	6,733 $6,336,233	9,606 $8,420,955	3,286 $3,087,024	32,889 $30,906,949
Central American States:										
Costa Rica				1 $2,275			5 $7,057	21 $16,591	3 $5,239	30 $31,162
Guatemala					1 $802		4 $3,453	53 $44,675	4 $3,797	62 $52,727
Honduras	2 $3,682		5 $8,928	5 $7,302			8 $13,835	8 $21,972	6 $8,945	34 $64,664
Nicaragua	2 $2,170				2 $2,800	2 $3,781		9 $15,718	3 $4,209	18 $28,678
Panama		2 $9,488			16 $12,412	7 $5,600	12 $15,739	3 $4,779	4 $13,294	44 $61,312
Salvador				1 $2,800		1 $1,400	3 $5,800	5 $6,088		10 $16,088
Mexico	5 $13,600	5 $12,400	26 $41,449	59 $91,902	285 $430,472	113 $150,585	291 $326,855	391 $775,133	257 $494,898	1,432 $11,942,294
Newfoundl'd and Labrador							4 $15,996	2 $9,855		6 $25,851
West Indies, British:										
Barbados					3 $2,015		8 $6,424	4 $3,225	5 $4,959	20 $16,623
Jamaica					1 $230	8 $7,614	13 $16,034	16 $17,995	11 $12,964	49 $54,837
Trinidad and Tobago					1 $1,632	5 $8,349	11 $15,076	11 $23,981	1 $1,545	29 $50,583
Other British					2 $1,708	1 $1,496	3 $2,550	6 $5,966	1 $150	13 $11,870
Cuba	15 $54,845	24 $77,531	60 $135,309	179 $209,157	165 $247,662	110 $154,615	253 $345,404	390 $606,739	32 $61,576	1,228 $1,892,838
Dominican Republic			1 $858	1 $4,650	4 $3,590		14 $14,814	47 $126,239	14 $23,461	81 $173,612
Danish West Indies (Virgin Islands:						3 $3,525	2 $2,177	12 $18,940	52 $3,011	69 $27,653
Dutch	1 $1,525						2 $704		1 $1,959	4 $4,188
French					2 $2,095		8 $10,065	3 $1,953	4 $2,204	17 $16,317
Haiti					1 $1,150		13 $16,146	9 $34,490	2 $1,540	25 $53,326

Exports, 1914-1921

	1914	1915	1916	1917	1918	July 1 to Dec. 31 1918	Calendar Year 1919	1920	1921	Total for All Years
South America)										
Argentina	*73* $103,915	*4* $1,828	*18* $37,926	*5* $7,848	*7* $4,050	*46* $66,778	*528* $393,807	*920* $721,527	*611* $622,313	*2,212* $1,959,992
Bolivia						*4*	*7*	*9*	*3*	*23*
						$6,300	$4,950	$3,519	$17,747	$32,516
Brazil	*6* $8,326	*1* $2,724	*5* $3,216	*8* $7,499	*4* $11,600	*11* $12,600	*96* $75,054	*269* $308,236	*71* $45,621	*471* $474,876
Chile	*4* $10,540	*1* $1,346		*1* $3,175	*16* $18,296	*2* $2,922	*167* $169,552	*333* $304,242	*19* $13,518	*543* $523,591
Colombia	*1* $3,620		*1* $2,100		*12* $10,728	*1* $4,377		*14* $34,890	*40* $87,920	*69* $143,635
Ecuador							*5* $7,125	*5* $6,000	*8* $9,507	*18* $22,632
Guiana, British				*1* $3,100	*16* $13,727	*17* $16,683	*32* $47,820	*76* $96,719		*142* $178,049
Guiana, Dutch							*2* $2,536	*8* $19,739	*4* $4,687	*14* $26,962
Guiana, French								*1* $4,814		*1* $4,814
Paraguay	*1* $1,63				*6* $7,111			*2* $8,050		*9* $16,799
Peru	*16* $5,86	*3* $3,07		*16* $19,508	*83* $101,594	*154* $182,418	*317* $314,018	*701* $552,360	*57* $56,804	*1,326* $1,236,538
Uruguay						*7*	*59*	*112*	*2*	*180*
						$5,495	$46,773	$100,825	$2,820	$155,913
Venezuela	*3* $3,753			*3* $8,237			*22* $26,149	*45* $57,543	*19* $76,385	*92* $172,067
Asia:										
China				*4* $3,396			*7* $13,091	*14* $29,814	*1* $1,288	*26* $47,589
Armenia, etc.									*1* $1,740	*1* $1,740
Hejas, etc.									*2* 7,479	*2* 7,479
Kwantung, leased territory				*3* $2,898			*1* $2,670	*2* $2,600		*6* $8,168
Chosen							*14* $22,271			*14* $22,271
Palestine and Syria									*3* $4,500	*3* $4,500
Persia									*2* $16,068	*2* $16,068
East Indies, British:										
British India	*2* $4,629			*3* $1,900	*1* $2,842	*2* $2,318	*105* $86,437	*315* $294,668	*96* $140,925	*524* $533,719
Straits Settlements		*1* $3,000			*1* $2,063		*37* $26,81	*145* $207,281	*45* $53,663	*224* $292,825
Other							*13* $8,110	*17* $11,160		*30* $19,270
Dutch	*5* $18,217	*3* $12,421	*5* $24,400	*2* $10,241	*7* $5,847		*47* $68,248	*184* $352,725	*153* $243,969	*406* $736,068
French				*1* $4,900			*2* $1,552	*73* $58,024		*76* $64,476
Hong Kong								*1* $3,303		*1* $3,303
Japan			*14* $20,332	*5* $15,016	*11* $13,302		*50* $172,036	*146* $119,000	*60* $57,441	*286* $397,127
Russia in Asia			*113* $305,192				*2* $7,500			*115* $312,692
Siam							*3* $8,047	*12* $19,588	*6* $20,019	*21* $47,654
Turkey in Asia	*1* $2,762						*1* $440	*25* $27,868	*20* $25,288	*47* $56,358
Oceania, British:										
Australia	*42* $71,428	*18* $37,144	*32* $37,441	*22* $25,015	*21* $19,505	*21* $24,123	*252* $279,371	*600* $487,152	*228* $169,973	*1,236* $1,151,152
New Zealand			*16* $16,839	*54* $57,863	*40* $46,499	*286* $181,588	*170* $180,592	*322* $360,734	*108* $42,880	*996* $886,995
Other British				*2* $2,964				*3* $2,040		*5* $5,004
German							*1* $614			*1* $614
French				*1* $1,453				*2* $1,929		*3* $3,382
Philippine Islands	*3* $12,992	*2* $9,560	*7* $9,137	*13* $28,107	*52* $102,408	*687* $769,045	*1,461* $1,763,878	*220* $241,991	*2,445* $2,937,118	
Africa :										
Belgian Kongo						*1* $3,417		*3* $1,778	*4* $5,195	
British Africa:										
West	*1* $4,760							*6* $30,068	*1* $351	*8* $35,179
South	*4* $11,399	*3* $3,613	*2* $1,527	*4* $3,240	*36* $21,267	*14* $9,900	*325* $189,392	*407* $413,015	*22* $29,933	*817* $683,286
East						*1*	*15*	*61*	*19*	*96*
						$300	$20,849	$71,478	$23,604	$116,231
Egypt	*3* $7,988					*7* $2,185	*29* $23,249	*170* $188,680	*9* $13,858	*218* $235,960
French Africa	*1* $2,289		*8* $8,305	*1* $1,124	*7* $5,250	*363* $390,261	*344* $278,181	*58* $64,215	*782* $749,625	
Kamerum, etc.									*1* $700	*1* $700
Italian, Africa									*1* $600	*1* $600
Morocco				*1* $1,180	*1* $575	*110* $71,569	*6* $8,377		*118* $1,771	
Portuguese Africa		*1* $1,620		*3* $7,144		*2* $6,970	*15* $30,911		*21* $46,645	
Totals	*721* $1,416,294	*455* $983,198	*1,858* $3,726,496	*7,988* $10,540,639	*23,560* $23,995,023	*8,426* $9,614,479	*20,436* $20,026,172	*22,481* $21,965,959	*8,081* $8,223,672	*94,006* $100,491,932

Tire Exports, 1911 to 1921

	1911	1913	1914	1915	1917	1918	July 1 to Dec. 31, 1918	Calendar Year 1919	1920†	1921†	Totals Including 1912, 1916
Europe:											
Austria-Hungary	$329	$299	$1,009	.....	.....	.....	.....	$43,121	$224,087	$95	$271,313
Azores and Madeira Islands	.....	.....	138	$178	.....	$72	.....	.....	66,698	469	77,928
Belgium	821	401,900	15,730	.....	.....	.....	$28,718	532,532	1,280,309	74,315	2,386,045
Bulgaria	.....	500	170	150	.....	.....	.....	.....	3,570	.....	4,390
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	154	8,568	8,722
Denmark	98	16,611	11,414	12,288	$6,917	.....	.....	1,254,324	959,241	279,370	2,556,620
Esthonia	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,316	4,316
Finland	.....	1,545	4,585	.....	.....	.....	.....	23,367	440,157	47,845	517,539
France	185,473	20,205	5,448	8,723	425,132	661,648	425,149	3,535,178	2,369,018	384,358	8,417,384
Germany	29,979	401,196	132,181	6,090	.....	.....	.....	33,280	576,714	13,283	1,193,883
Gibraltar	.....	.....	.....	.....	.....	129	.....	175	43,028	508	43,840
Greece	.....	.....	271	2,680	34,654	2,000	.....	83,449	311,079	111,538	546,370
Iceland and Faroe Islands	.....	.....	.....	.....	61	.....	.....	23,961	2,855	6,991	33,868
Italy	537	1,150	915	11,740	101,362	55,913	585	226,245	992,648	25,110	1,752,029
Jugoslavia	.....	.....	.....	.....	.....	.....	.....	300	16,674	20,736	37,710
Latvia	.....	.....	.....	.....	.....	.....	.....	.....	.....	47	47
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,416	1,416
Malta, Gozo and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	424	72,669	11,805	84,898
Netherlands	.....	424	2,286	1,907	26,326	215	.....	1,043,981	1,813,149	112,028	3,027,269
Norway	1,295	456	5,649	7,394	11,937	525	6,668	845,690	1,430,389	320,256	2,640,339
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	278,096	32,902	310,998
Portugal	693	282	157	1,434	9,055	15,488	4,388	176,303	367,321	17,166	518,548
Roumania	.....	146	211	.....	.....	.....	.....	70,785	590,620	45,892	708,404
Russia in Europe	655	729	1,168	6,480	143,916	94,264	211	1,402	13,569	.....	1,388,127
Spain	3,547	567	1,595	2,408	77,753	12,233	20,899	825,007	1,925,185	311,841	3,214,019
Sweden	8,335	5,301	77,537	26,707	6,347	.....	18,825	1,373,847	2,619,103	566,242	4,745,739
Switzerland	.....	.....	.....	.....	.....	.....	.....	220,052	628,659	97,376	946,087
Turkey in Europe	.....	.....	.....	1,927	.....	.....	.....	85,334	215,834	44,503	347,598
England	1,104,416	1,125,718	1,503,440	2,655,099	2,569,901	.....	78,573	1,508,460	4,178,548	3,352,008	29,047,161
Scotland	.....	.....	336	245	66,753	618,071	.....	263	144,294	4,390	333,139
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	2,220	841	4,604
North America:											
Bermuda	.....	401	267	139	14	409	.....	268	593	564	4,095
British Honduras	15	163	727	64	590	3,469	2,503	6,663	6,744	4,990	26,576
Canada	405,778	1,324,459	961,937	772,574	1,485,939	1,766,518	350,345	1,021,014	2,704,230	1,041,168	13,707,233
Miquelon, Langley, etc.	.....	.....	.....	.....	.....	.....	.....	.....	20	.....	20
Newfoundland and Labrador	955	693	1,668	4,034	8,243	11,317	8,952	24,319	31,871	18,674	106,978
Central American States:											
Costa Rica	951	2,793	6,877	2,381	11,918	4,018	4,505	12,301	15,568	9,350	78,593
Guatemala	1,343	2,224	5,547	3,406	24,545	7,089	15,642	64,981	61,776	41,686	236,666
Honduras	.....	299	1,392	3,229	19,657	19,602	8,813	35,489	26,455	23,529	146,799
Nicaragua	.....	429	180	419	294	1,042	2,743	32,075	26,480	12,131	76,080
Panama	5,379	19,466	18,362	24,549	74,047	137,609	51,959	416,637	482,641	147,056	1,455,632
Salvador	525	1,705	2,084	2,617	22,530	22,319	17,036	95,664	98,074	50,971	212,844
Mexico	144,893	203,883	111,948	106,083	257,413	777,984	566,442	805,614	1,438,777	1,368,253	6,166,580
West Indies, British:											
Barbados	1,227	4,588	4,351	4,136	15,666	19,391	20,385	31,026	31,813	32,407	172,628
Jamaica	11,614	30,004	55,361	36,887	109,048	109,097	76,099	156,822	271,381	130,884	1,046,836
Trinidad and Tobago	689	16,364	17,023	22,672	45,654	107,353	49,838	78,435	184,000	122,641	677,515
Other British	477	1,869	2,472	3,327	21,526	25,991	20,787	33,700	83,550	19,735	222,281
Cuba	27,072	12,322	55,236	192,355	1,019,915	1,336,233	929,796	2,013,071	3,409,986	1,372,108	10,937,218
Danish (Virgin Islands of U. S.)	.....	540	1,739	577	2,753	6,939	6,089	8,679	21,658	29,227	79,490
Dominican Republic	321	2,306	2,902	3,062	37,441	61,684	54,755	121,891	274,442	138,811	718,772
Dutch	30	767	746	3,068	7,386	9,084	8,190	10,390	24,137	17,702	86,060
French	.....	115	1,045	1,527	19,399	36,474	32,493	159,176	103,374	20,898	375,908
Haiti	.....	765	2,336	526	2,287	13,091	16,323	60,102	83,815	40,153	220,396
South America:											
Argentina	3,541	8,153	21,920	34,096	1,301,344	1,649,840	859,259	1,788,147	3,126,889	837,960	10,129,674
Bolivi	.....	106	1,526	3,413	9,187	20,513	22,558	24,191	31,974	10,150	128,572
Brazil	10,112	47,537	11,839	27,425	606,876	455,102	111,550	1,018,055	1,965,201	226,694	4,940,822
Chile	262	2,844	10,636	21,353	264,608	725,876	481,919	795,440	525,635	112,338	3,010,069
Colombia	2,564	16,211	18,925	15,239	30,298	54,648	20,276	124,238	183,859	64,314	573,457
Ecuador	392	8,459	3,313	8,620	13,645	46,305	20,052	77,189	52,297	30,044	270,156
Falkland Islands	.....	.....	.....	.....	1,817	.....	.....	.....	.....	486	2,303
Guiana, British	624	2,726	3,420	3,884	10,171	29,437	39,488	49,637	108,717	21,941	277,362
Dutch	.....	63	544	308	2,588	1,918	3,385	3,265	5,518	4,401	22,329
French	.....	.....	.....	.....	45	.....	75	81	420	322	957
Paraguay	.....	.....	.....	16	35	.....	264	2,046	1,245	503	4,109
Peru	557	1,273	4,838	5,253	27,934	107,236	156,232	230,812	263,698	175,879	984,120
Uruguay	586	1,990	17,987	11,826	100,427	224,694	72,735	645,970	903,687	157,873	2,215,232
Venezuela	130	10,703	20,439	32,635	128,966	116,612	67,565	226,953	285,497	142,477	1,105,661
Asia:											
Aden	.....	.....	55	264	440	2,536	.....	1,847	16,714	8,459	31,930
China	590	622	28,326	18,971	36,952	53,089	48,536	254,784	421,364	126,585	1,031,917
Kwantung (leased territory)*	.....	152	.....	.....	.....	547	.....	1,425	3,710	106	7,120
Chosen (Korea)	.....	240	2,578	2,189	3,909	927	1,388	11,538	16,966	8,373	52,438
British India	874	882	3,555	15,441	145,820	416,411	133,146	557,396	1,096,377	390,931	2,880,751
Straits Settlements	283	1,133	7,174	8,595	142,271	214,887	352,666	636,101	1,109,200	111,966	2,649,160
Other British East Indies	160	337	30	1,883	6,692	52,466	20,236	18,477	33,169	7,894	160,763
Dutch East Indies	916	860	2,677	7,688	415,742	347,912	416,036	686,873	1,712,524	501,798	4,300,483
French East Indies	916	860	2,677	7,688	415,742	347,912	1,514	7,518	6,594	3,156	1,002,044
French Indo-China	.....	.....	.....	.....	.....	.....	.....	.....	.....	345	345
Greece in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,843	4,843
Hejaz, Arabia and Mesopotamia	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,736	8,736
Hongkong	997	677	1,057	879	3,252	6,412	15,289	79,334	41,268	48,495	262,417
Japan	15,319	29,975	18,629	12,741	34,243	83,235	57,441	422,432	491,246	191,477	1,390,414
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	.....	33,966	33,966
Persia	.....	.....	.....	.....	.....	.....	.....	1,092	8,091	3,461	12,644
Russia in Asia	.....	.....	.....	.....	12,432	.....	8,806	266,674	17,923	.....	305,935
Siam	207	1,334	92	742	8,547	16,179	12,444	12,239	18,843	11,833	84,686
Turkey in Asia	.....	.....	.....	4,037	.....	.....	1,067	12,734	77,202	62,197	157,396
Oceania, British:											
Australia	3,292	58,068	94,321	245,240	783,209	819,755	496,882	751,584	1,498,312	260,844	5,338,276
New Zealand	7,078	26,270	35,695	201,379	689,705	946,804	354,715	1,023,807	2,255,999	614,703	7,112,010
Other British	.....	37	432	164	5,008	16,124	617	7,118	14,074	13,887	58,335
French	.....	.....	396	.....	518	5,211	6,073	13,516	13,719	15,006	54,585
Other Oceania	36	956	7,278	5,262	8,102	10,801	2,854	8,862	5,676	4,921	64,403
Philippine Islands	90,759	100,476	141,205	250,832	345,702	863,727	423,568	1,372,544	2,423,198	656,573	7,133,981
Africa:											
Belgian Kongo	.....	.....	.....	.....	.....	.....	.....	.....	2,352	.....	2,369
British Africa, West	.....	89	.....	1,149	10,967	33,470	25,210	122,940	709,696	151,674	1,082,544
South	8,310	17,057	27,090	32,822	391,211	693,065	372,606	479,934	1,778,167	256,488	4,355,017
East	.....	536	642	4,833	20,162	21,849	165	32,402	119,281	52,916	260,570
Canary Islands	.....	270	.....	.....	.....	.....	.....	4,545	18,326	24,951	49,960
Egypt	.....	.....	208	63	1,316	.....	.....	25,881	143,772	53,158	224,930
French Africa	.....	.....	.....	.....	420	2,399	131	28,821	53,082	5,742	90,695
Italian Africa	.....	.....	.....	.....	174	.....	.....	.....	.....	.....	174
Kamerun	.....	.....	.....	.....	.....	.....	.....	.....	8,125	919	9,044
Liberia	.....	.....	.....	.....	92	.....	.....	45	2,661	161	2,959
Madagascar	.....	.....	.....	.....	.....	.....	565	.....	.....	.....	762
Morocco	.....	.....	.....	.....	.....	.....	.....	225	14,830	2,951	18,006
Portuguese Africa	71	.....	.....	946	.....	.....	2,698	150	29,732	1,644	38,950
										Grand Total	$165,865,931

*Previous to 1918 listed as British, French and Japanese China. †Includes Casings, Inner Tubes and Solid Tires.

American Exports to Noncontiguous Possessions

AUTOMOBILES

Country	1919	1920	1921 (11 months)
Alaska	55	235	63
	$51,485	$303,219	$66,542
Hawaii	1,382	2,860	2,561
	$1,456,196	$3,011,547	$2,531,612
Porto Rico	645	1,544	451
	$854,602	$2,075,175	$507,857
Total number	2,082	4,639	3,075
Total value	$2,362,283	$5,389,941	$3,106,011

PARTS

Country	1917	1918	1919	1920	1921 (11 mos.)
Alaska	$35,701	$37,071	$42,080	$109,596	$42,092
Hawaii	352,242	333,720	329,892	595,765	455,893
Porto Rico	205,525	241,562	314,023	642,422	273,707
Total value	$693,468	$612,353	$685,995	$1,347,783	$771,692

TRUCKS

Country	1919	1920	1921 (11 months)
Alaska	35	99	14
	$29,649	$89,748	$9,554
Hawaii	229	495	214
	$417,122	$687,390	$342,775
Porto Rico	131	429	118
	$344,887	$1,064,207	$175,388
Total number	395	1,023	346
Total value	$791,658	$1,841,345	$527,717

TIRES

Alaska...Tires not separated from other rubber goods.		
Hawaii,	1917	$997,550
	1918	963,329
	1919	1,135,412
	1920	1,306,980
	1921 (11 months)	1,082,995
Porto Rico,	1917	712,052
	1918	812,444
	1919	867,457
	1920	1,396,912
	1921 (11 months)	590,176

American Airplane Exports, 1916-1921

Countries	1916	1917	1918	1919	1920	1921	Totals
France				2	2		4
				$15,000	$42,600		$57,600
Norway				2			2
				$22,000			$22,000
Sweden			3				3
			$44,239				$44,239
England	240	12	4			2	258
	$1,964,094	$170,954	$27,775			$10,000	$2,172,823
Spain	4						4
	$37,980						$37,980
Netherlands			6				6
			$76,226				$76,226
Canada	16	102	2	8	5	1	134
	$95,046	$616,068	$6,500	$28,200	$27,160	$5,000	$777,974
Mexico					4	15	19
					$28,000	$98,165	$126,165
Cuba					2	1	5
				$5,000	$15,500	$8,000	$28,500
Argentina	1				9	19	29
	$5,000				$38,050	$79,500	$122,550
Bolivia					1		1
					$25,180		$25,180
Brazil	3		2	1	9	1	16
	$20,000		$34,500	$18,000	$109,000	$1,396	$182,896
Colombia				1	1	1	3
				$10,000	$10,000	$5,000	$25,000
Peru				1	25	2	28
				$4,500	$272,750	$5,000	$282,250
China					5		5
					$20,220		$20,220
Japan	2	7	3		1	1	14
	$8,400	$52,520	$16,880		$5,714	$15,000	$98,514
Australia		2		2			4
		$17,000		$20,000			$37,000
Philippine Islands				25	1	2	28
				$92,600	$4,000	$61,079	$157,679
British Jamaica	1						1
	$875						$875
Dutch East Indies	2	12					14
	$27,000	$145,000					$172,000
Nicaragua						2	2
						$25,000	$25,000
Hong Kong						1	1
						$1,800	$1,800
Totals	269	135	20	44	65	48	581
	$2,158,395	$1,001,542	$206,120	$215,300	$598,174	$314,940	$4,494,471
Parts of Aeroplanes	$4,843,610	$3,133,903	$8,877,977	$3,249,226	$554,375	$157,608	$20,816,699

American Motor Boat Exports

1914-1921

Year	No.	Value
1914	400	$519,584
1915	164	$273,516
1916	264	$800,231
1917	230	$917,438
1918	218	$2,460,583
July 1-Dec. 31 1918	104	$2,126,682
1919	140	$358,851
1920	298	$1,008,872
1921	171	$1,007,620
Total	1,789	$9,473,377

American Marine Engine Exports

1914-1921

Year	No.	Value
1914	11,606	$1,599,364
1915	5,907	$753,476
1916	8,002	$3,139,955
1917	9,815	$2,204,114
1918	7,225	$2,553,104
July 1-Dec. 31 1918	2,814	$1,496,859
1919	10,485	$5,894,055
1920	9,615	$3,283,032
1921	4,016	$1,406,291
Total	69,485	$22,330,250

THE latest official statistics available concerning the Irish automotive trade are for 1920. The value of automotive products imported by Ireland during 1919 and 1920 were as follows:

	1919	1920
Cars	£895,000	£3,600,000
Motorcycles	83,100	120,000

These are total figures and include products which came through as well as from England together with those which went direct to Ireland. The value of direct imported cars and chassis into Ireland for 1920 was as follows:

From	
U. S. A.	£464,519
Belgium	33,889
Canada	29,332
Germany	1,488

Exports of Foreign Nations Show Scope of World Automotive Trade

British, Canadian, French, Italian, Belgian and German export figures are presented here in more detail than has ever before been available. The compilations, specially arranged for automotive manufacturers, help to make complete the picture of automotive commerce throughout the world.

PERHAPS the most striking feature of the export statistics of other automotive manufacturing countries is the divergence of practice as regards the presentation of export information. In some instances such as France, for example, the figures are presented in such a way as to mean almost nothing from a commercial point of view. In other cases the information is not sufficiently segregated and classified to be of maximum value. This is probably due to the fact that automotive exports have not played so important a part in the foreign trade of any country as they have in the case of the United States.

A study of British and French statistics for a period of years, however, indicates that each year more complete information is being given. The figures presented in the accompanying tables have been specially compiled in convenient form so that automotive manufacturers may be able to analyze readily both the size, character and location of their chief competition.

British exports for 1921 show that the automotive trade in England failed to hold up as well from an export standpoint as did American. The British totals, of course, do not compare in volume with those of the United States, but they have been nearly twice as large as those of Canada, viewing the figures in a general way for several years back.

Canadian exports took a decided drop in every automotive line last year. The 1921 figures are for eight months ending in November, the Canadian figures being kept on a March 1 to March 1 fiscal year basis. Thus the column head 1921 really consists chiefly of 1920 figures. Even though four months are missing, the statistics indicate this drop.

The number of passenger cars exported from Canada during the eight months included in the returns, for instance, has not reached a total of half the previous year. The situation as regards truck exports is worse, as the eight months' total is only about 13 per cent of the previous year's twelve months' total. These percentages are rather unfavorable, but do not by any means indicate a cessation of export activity in Canada. Despite the depression, $4,584,134 worth of automotive products were shipped out of Canada during the eight months of their last fiscal year.

A closer analysis of the figures shows that a large

British Parts Exports

Destination	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	Total
Argentine Republic	£83,111	£80,489							£14,472	£26,195		£204,267
Belgium	£53,079	£65,706	£67,664	£61,872	£13				£61,485	£132,858	£67,375	£510,052
Brazil									£7,556	£14,576	£37,760	£59,892
Denmark (including Faroe Islands)									£25,135	£80,386	£21,964	£127,485
France	£240,159	£231,762	£228,439	£170,569	£167,919	£271,953	£287,976	£164,478	£507,516	£450,780	£95,096	£2,816,647
Germany	£52,725	£75,278	£88,432	£63,574					£26	£4,118		£284,153
Italy	£53,037	£64,881	£63,136	£59,579		£91,265	£95,510	£78,340	£111,058	£192,513		£809,319
Japan (including Formosa and Japanese leased territories in China)			£10,065	£3,885	£1,782				£12,070	£21,579	£35,692	£85,073
Java									£14,675	£26,593		£41,268
Netherlands	£44,183	£26,835							£32,233	£90,942		£194,193
Norway									£7,798	£13,825		£21,623
Russia	£9,945	£15,702	£11,156	£141,129	£53,551	£32,764	£177,519		£1,392	£4,862	£1,111	£449,131
Spain							£25,198	£9,287	£25,962	£50,540	£56,010	£166,997
Sweden									£5,649	£42,167		£47,816
Switzerland			£4,696	£17,715	£602				£31,694	£17,372		£72,079
Turkey									£4,767	£20,759		£25,526
United States of America	£22,540	£39,604	£47,171	£49,249	£17,826	£20,448	£10,922	£4,422	£5,330	£26,009	£35,569	£279,090
Other Foreign Countries	£146,675	£225,406	£103,488	£96,844	£92,622	£118,958	£66,348	£42,092	£46,838	£150,838	£390,312	£1,480,421
Totals—Foreign Countries	£705,454	£825,663	£624,247	£664,416	£334,315	£535,388	£663,473	£298,619	£915,656	£1,366,912	£740,889	£7,675,032
Australia	£84,410	£103,357	£118,587	£139,034	£137,388	£56,574	£43,262	£36,145	£102,877	£271,034	£112,183	£1,204,851
British East Indies			£15,244	£19,526	£21,185	£114,981	£103,478	£77,328				£351,742
British India	£100,828	£104,517	£84,251	£69,342	£68,185				£163,434	£178,670	£264,670	£1,033,897
British West Africa									£12,053	£17,854		£29,907
Canada	£36,816	£27,093	£3,940	£2,634	£1,837				£6,354	£12,503	£13,885	£105,062
Cape of Good Hope	£38,512	£49,829	£48,991	£38,675	£36,488	£30,302	£17,396	£8,492	£19,058	£59,033	£29,898	£376,674
Ceylon and Dependencies									£11,421	£30,026	£8,028	£49,475
Egypt									£20,415	£45,247	£12,222	£77,884
Natal	£5,296	£5,188							£3,173	£16,151	£7,319	£37,127
New Zealand	£39,435	£41,945	£52,847	£60,517	£61,257	£38,136	£28,518	£17,129	£47,520	£132,492	£36,831	£556,627
Straits Settlements and Dependencies (including Labuan)									£15,265	£53,706	£25,547	£94,518
Transvaal	£37,061	£46,593	£32,702	£29,372	£21,915	£28,238	£15,630	£14,636	£10,283	£24,920	£9,880	£271,230
Union of South Africa									£26,271	£59,832		£86,103
Other British Possessions	£116,428	£203,722	£34,760	£37,791	£39,087	£38,917	£33,528	£23,836	£36,718	£77,734		£642,521
Total—British Possessions	£458,786	£582,244	£391,322	£396,891	£387,342	£307,148	£241,812	£177,566	£474,842	£979,202	£520,463	£4,917,618
Total—Exported from United Kingdom	£1,164,240	£1,407,907	£1,015,569	£1,061,307	£721,657	£842,536	£905,285	£476,185	£1,390,498	£2,346,114	£1,261,352	£12,592,650

British Exports—Complete Motor Vehicles

Destination	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	Total
Argentine	*194* £96,332	*247* £114,095	*304* £127,881	*62* £26,852	*23* £8,355	*2* £2,354	.....	.....	*19* £11,304	*54* £58,042	.....	*905* £445,215
Belgium	*47* £18,560	*91* £23,642	*154* £40,051	*199* £44,230	.....	.....	.....	.....	*177* £119,629	*98* £82,991	*29* £28,111	*795* £357,214
Brazil	*113* £41,934	*198* £69,005	*77* £28,098	*39* £14,951	*4* £943	*2* £965	*8* £1,036	.....	*3* £2,138	*78* £67,922	*26* £27,607	*548* £254,599
China (Exclusive of Hong Kong, Macao and leased territories)	.....	.....	.....	.....	.....	.....	.....	.....	*10* £4,443	*207* £161,687	.....	*217* £166,130
Denmark (including Faroe Is'ands)	*13* £3,382	*42* £11,884	*146* £30,689	*125* £32,053	*142* £30,813	*110* £69,831	*27* £14,049	*2,195*	*77* £54,429	*148* £130,198	*49* £47,490	*879* £427,013
France	*82* £42,736	*126* £63,380	*419* £87,678	*110* £38,295	*410* £190,848	*456* £214,550	*113* £38,611	*2,527* £1,812,131	*325* £248,939	*67* £52,378	*40* £41,413	*4,675* £2,830,959
Germany	*20* £9,480	*43* £12,841	*109* £28,482	*35* £12,809	.....	.....	.....	.....	.....	*9* £7,905	.....	*216* £71,517
Japan (Including Formosa and Japanese leased territories in China)	*33* £12,976	*80* £40,222	*69* £26,506	*15* £7,718	*4* £1,015	*17* £7,528	.....	.....	*29* £35,721	*99* £112,574	*70* £73,217	*416* £317,477
Java	*53* £19,990	*51* £18,007	*77* £30,530	*123* £34,745	*46* £12,808	*9* £4,066	.....	.....	*3* £2,095	*93* £63,721	.....	*455* £185,962
Netherlands	.....	.....	.....	.....	.....	.....	.....	.....	*35* £21,513	*139* £99,673	.....	*174* £121,186
Norway	.....	.....	.....	.....	.....	.....	.....	.....	*19* £19,241	*54* £36,121	.....	*73* £55,362
Persia	.....	.....	.....	.....	.....	.....	.....	.....	.....	*27* £24,246	.....	*27* £24,246
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	.....	*30* £19,968	.....	*30* £19,968
Roumania	.....	.....	.....	.....	.....	.....	*183* £33,345	.....	*38* £35,100	*15* £20,370	*8* £5,741	*244* £94,556
Russia	*81* £39,704	*103* £57,547	*429* £114,806	*312* £187,525	*276* £194,727	*590* £445,545	*658* £423,591	.....	.....	*6* £10,189	*4* £9,100	*2,459* £1,482,734
Spain	*34* £15,576	*44* £16,588	*120* £33,729	*60* £25,421	*22* £11,290	*20* £8,523	*23* £12,117	*6* £7,307	*51* £41,469	*166* £159,739	*79* £92,435	*625* £424,194
Sweden	.....	.....	.....	.....	.....	.....	.....	.....	*29* £17,284	*71* £53,119	.....	*100* £70,403
Turkey	.....	.....	.....	.....	.....	.....	.....	.....	*22* £13,894	*129* £103,315	.....	*151* £117,209
United States of America	*50* £27,516	*76* £41,464	*76* £59,600	*64* £41,339	*33* £23,792	*74* £80,136	*31* £37,144	*5* £5,250	*8* £12,720	*30* £41,290	*26* £43,963	*473* £414,214
Other Foreign Countries	*307* £137,459	*420* £158,671	*561* £172,070	*463* £165,166	*112* £36,518	*101* £49,832	*84* £40,405	*96* £76,034	*70* £51,979	*310* £238,222	*1,164* £883,332	*3,688* £2,009,688
Totals to Foreign Countries	*1,027* £465,645	*1,521* £627,346	*2,541* £780,120	*1,607* £631,104	*1,072* £511,109	*1,381* £883,330	*1,127* £600,298	*2,634* £1,902,917	*915* £691,898	*1,780* £1,543,670	*1,495* £1,252,409	*17,100* £9,889,846
Australia	*1,208* £433,530	*1,118* £402,389	*1,055* £348,017	*1,191* £369,306	*430* £129,344	*145* £42,778	*3* £9,039	*4* £733	*53* £32,530	*258* £179,739	*189* £144,308	*5,681* £2,091,713
British India	*725* £276,275	*706* £252,010	*1,223* £379,195	*1,121* £325,777	*718* £206,061	*340* £106,616	*124* £69,305	*74* £81,306	*287* £203,393	*1,570* £1,132,631	*552* £540,763	*7,440* £3,573,332
Canada	*113* £67,280	*123* £77,683	*169* £91,511	*94* £54,531	*7* £5,925	*10* £7,993	*3* £1,150	*3* £1,800	*2* £2,600	*3* £2,938	*42* £58,749	*569* £372,160
Cape of Good Hope	*281* £99,996	*311* £117,237	*557* £172,491	*321* £95,168	*117* £31,503	*47* £10,397	*12* £3,320	*1* £246	*15* £8,941	*184* £105,107	*84* £53,267	*1,930* £697,673
Ceylon and Dependencies	*125* £48,964	*142* £53,207	*178* £57,102	*156* £46,975	*62* £18,869	*47* £15,982	*3* £1,646	.....	*8* £3,952	*88* £45,838	*40* £24,200	*849* £316,735
Channel Islands	.....	.....	.....	.....	.....	.....	.....	.....	*47* £13,680	*39* £14,221	.....	*86* £27,901
Egypt	.....	.....	.....	.....	.....	.....	*81* £16,542	*136* £40,044	*44* £26,726	*188* £150,016	*46* £35,360	*495* £268,688
Federated Malay States	*89* £36,130	*116* £45,987	*191* £64,449	*76* £22,883	*14* £3,875	*16* £3,255	*7* £1,565	*3* £670	*16* £9,589	*52* £41,632	*31* £27,396	*611* £257,431
Natal	*67* £24,779	*83* £27,644	*115* £31,857	*100* £32,563	*28* £6,981	*13* £3,620	*6* £1,802	.....	*6* £3,592	*48* £32,044	*31* £23,641	*497* £188,523
New Zealand	*472* £193,583	*594* £221,188	*829* £245,096	*907* £249,924	*604* £154,489	*184* £51,443	*30* £8,209	*4* £1,528	*61* £34,052	*464* £297,879	*151* £99,869	*4,300* £1,557,260
Straits Settlements and Dependencies (including Labaun)	*128* £47,647	*180* £66,792	*285* £87,085	*165* £48,664	*39* £10,524	*54* £15,721	*55* £14,300	.....	*24* £10,987	*256* £183,190	*67* £53,267	*1,253* £538,177
Transvaal	*155* £53,600	*239* £84,373	*262* £83,180	*149* £51,333	*46* £13,208	*59* £13,521	*8* £1,916	*1* £324	*7* £3,934	*47* £30,308	*26* £19,217	*999* £354,914
Other British Possessions	*146* £56,990	*144* £47,859	*190* £56,266	*167* £43,998	*142* £37,581	*187* £43,230	*79* £13,435	*31* £7,067	*29* £10,846	*282* £178,318	.....	*1,397* £495,590
Total Exports from United Kingdom	*3,509* £1,338,774	*3,756* £1,396,369	*5,054* £1,616,249	*4,447* £1,341,122	*2,207* £618,360	*1,102* £314,556	*438* £142,229	*257* £133,718	*599* £364,822	*3,479* £2,393,861	*2,754* £2,332,446	*43,207* £21,882,352

percentage of Canadian exports during the four years shown in the tables have gone to British possessions. This trend is even more marked in an analysis of the British exports, in which it appears that more than 60 per cent of Great Britain's automotive export trade has been sent to its own possessions.

The Canadian figures show a remarkable decrease in parts exports to certain South American countries during the last four years. In 1919, for instance, Canada exported $287,478 worth of parts to the Argentine, but that total had steadily decreased every year since, until during the eight months of the present fiscal year it has reached a low point of $116.

The Italian figures show up favorably as compared with 1920. The first six months of 1921 were equal to just about half of the 1920 total in number of cars exported. This would indicate that Italian exports for 1921 held up remarkably well.

About the usual number of Italian cars were sold in the United States, 151 having been brought here during the first six months of 1921. In 1920 we took 209 Italian cars; in 1915, 163, and in 1914, 217.

Australia bought more Italian cars during the first six months of last year than during the entire twelve months of any previous year. Turkey, on the other hand, took only eight Italian cars in half of 1921, while it absorbed 363 during the previous year.

The Italian import figures show that Italy has taken only 13 American cars in the first half of 1921, as against the 151 Italian cars bought by America. Taking the 1920 totals into consideration as well, however, the balance is in favor of the United States by 577 to 360.

The German export figures are so incomplete as to be of little practical value. Through a strange mix-up in the German department which prepares these figures, the data for May to September, 1921, is available, but

British Exports—Motor Vehicle Chassis

Destination	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	Total
Argentine Republic	.....	.....	.....	.....	.....	.....	.....	.....	.....	*19* £19,209	.....	*19* £19,209
Belgium	*35* £13,690	*32* £11,191	*37* £13,520	*81* £49,577	.....	.....	.....	.....	*83* £59,160	*43* £43,324	*25* £35,809	*337* £226,271
Brazil	.....	.....	.....	.....	.....	.....	.....	.....	*5* £4,295	*19* £14,784	*8* £8,257	*32* £27,336
China (exclusive of Hong Kong Macao and leased territories)	.....	.....	.....	.....	.....	.....	.....	.....	*4* £3,707	*34* £26,328	.....	*38* £30,035
Cuba	.....	.....	.....	.....	.....	.....	.....	.....	.....	*24* £26,871	.....	*24* £26,871
Denmark (including Faroe Islands)	.....	.....	.....	.....	.....	.....	.....	.....	*43* £35,031	*23* £18,989	*2* £385	*68* £54,405
France	*77* £40,316	*114* £63,070	*134* £98,351	*154* £114,147	*35* £18,040	*139* £60,769	*190* £95,712	*25* £23,940	*31* £14,618	*91* £108,348	*72* £90,691	*1,062* £728,002
Germany	*55* £25,136	*32* £12,990	*25* £10,767	*26* £11,382	.....	.....	.....	.....	.....	.....	.....	*138* £60,275
Japan (Including Formosa and leased territories in China)	.....	.....	.....	.....	.....	.....	.....	.....	£1,86	*21* £13,406	*67* £39,974	*92* £55,244
Netherlands	.....	.....	.....	.....	.....	.....	.....	.....	*58* £44,696	*60* £48,784	.....	*118* £93,480
Norway	.....	.....	.....	.....	.....	.....	.....	.....	*13* £7,440	*11* £6,836	.....	*24* £14,276
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	*3* £2,120	*22* £16,842	.....	*25* £18,962
Russia	*7* £2,300	*11* £1,540	*8* £3,752	*383* £209,860	*48* £20,654	*48* £48,378	*391* £243,844	.....	.....	*15* £12,887	.....	*911* £543,215
Spain	.....	.....	.....	.....	.....	.....	.....	.....	*7* £3,937	*53* £46,431	*27* £40,656	*87* £91,024
Sweden	.....	.....	.....	.....	.....	.....	.....	.....	*2* £1,550	*21* £16,319	.....	*23* £17,869
United States of America	*59* £27,492	*14* £6,949	*7* £4,359	*65* £51,410	*53* £41,642	*36* £30,076	*5* £2,850	.....	*10* £8,742	*145* £214,357	*63* £104,891	*457* £492,768
Other Foreign Countries	*66* £23,425	*119* £48,759	*137* £39,997	*104* £43,167	*67* £17,253	*16* £8,236	*6* £2,717	*7* £2,697	*31* £24,166	*38* £41,814	*208* £204,842	*799* £457,073
Totals—Foreign Countries	*300* £132,359	*322* £144,499	*348* £170,746	*813* £479,543	*203* £97,589	*239* £147,459	*592* £345,123	*32* £26,637	*294* £211,326	*639* £675,529	*400* £525,505	*4,182* £2,956,315
Australia	*367* £137,062	*702* £229,592	*617* £175,154	*413* £122,591	*112* £35,173	*126* £42,016	*15* £4,283	*20* £3,374	*96* £56,911	*876* £515,418	*342* £235,749	*3,686* £1,557,332
British East Indies	*38* £16,592	*53* £21,018	*109* £45,405	*89* £34,570	*51* £16,568	*152* £65,739	*35* £18,448	*7* £6,170	.....	.....	.....	*534* £324,510
British India	.....	.....	.....	.....	.....	.....	.....	.....	.....	*174* £124,049	*908* £748,814	*49* £50,026	*1,131* £922,889
Canada	*8* £3,567	*37* £21,096	*65* £37,586	*13* £7,987	.....	.....	.....	.....	*14* £9,618	*26* £25,244	*21* £16,546	*184* £121,635
Ceylon and Dependencies	.....	.....	.....	.....	.....	.....	.....	.....	*7* £4,952	*36* £26,143	*2* £1,226	*45* £32,321
New Zealand	.....	.....	.....	.....	.....	*37* £10,308	*6* £3,638	*2* £1,350	*51* £43,157	*431* £316,089	*89* £74,477	*616* £449,019
Straits Settlements and Dependencies (Including Labaun)	.....	.....	.....	.....	.....	.....	.....	.....	*3* £2,737	*94* £82,933	*34* £24,282	*131* £109,952
Union of South Africa	.....	.....	.....	.....	.....	.....	.....	.....	*10* £7,283	*55* £44,594	.....	*65* £51,877
Other British Possessions	*22* £7,109	*66* £21,019	*95* £36,392	*108* £35,005	*117* £37,851	*12* £2,982	*10* £1,995	*4* £1,225	*29* £11,552	*59* £32,916	.....	*522* £188,046
Total British Possessions	*435* £164,330	*858* £292,725	*886* £294,537	*623* £200,153	*280* £89,592	*327* £121,045	*66* £28,364	*33* £12,119	*384* £260,259	*2,485* £1,792,151	*537* £402,306	*6,914* £3,657,581
Total	*735* £296,689	*1,180* £437,224	*1,234* £465,283	*1,436* £679,696	*483* £187,181	*566* £268,504	*658* £373,487	*65* £38,756	*678* £471,585	*3,124* £2,467680	*927,811* £900	*11,096* £6,613,896

Motorcycles and Tricars for 1911 to 1921, Inclusive

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Belgium	*62* £1,642	*149* £5,924	*651* £26,322	*775* £32,683	.....	*1* £38	.....	.....	*652* £42,211	*792* £64,385
Denmark (including Faroe Islands)	.....	.....	.....	.....	.....	.....	.....	.....	*666* £43,565	*945* £69,248
France	*66* £2,284	*235* £9,860	*580* £25,451	*1,037* £48,152	*1,240* £65,361	*1,813* £90,148	*4,308* £232,982	*3,329* £220,967	*2,302* £168,868	*1,017* £75,117
Italy	*219* £8,925	*730* £30,673	*1,781* £76,182	*2,811* £125,758	*481* £19,898	*642* £33,085	*383* £20,837	*1,076* £77,742	*311* £23,438	*1,430* £118,869
Japan (including Formosa and Japanese leased territories in China)	.....	.....	.....	.....	.....	.....	.....	.....	*63* £4,552	*308* £24,477
Netherlands	*138* £4,407	*172* £6,544	*563* £20,693	*941* £35,516	*666* £22,239	*1,204* £41,505	*331* £11,329	*6* £146	*501* £32,168	*2,765* £208,118
Russia	*63* £2,466	*91* £3,892	*214* £9,630	*3,597* £207,299	*1,043* £80,828	*794* £45,244	*5,131* £435,968	.....	*42* £3,865	*37* £3,334
Other Foreign Countries	*478* £18,359	*1,022* £41,507	*1,759* £74,223	*1,892* £81,069	*1,206* £50,447	*1,888* £82,090	*392* £17,828	*304* £13,130	*634* £45,410	*2,827* £229,354
Totals	*1,026* £38,083	*2,399* £98,400	*5,548* £232,501	*11,053* £530,477	*4,636* £238,773	*6,342* £292,110	*10,545* £718,944	*4,715* £311,985	*5,171* £364,077	*10,121* £792,902
Cape of Good Hope	*562* £19,817	*1,299* £54,482	*1,661* £72,906	*949* £44,205	*453* £21,548	*436* £21,444	*398* £19,676	*33* £1,759	*190* £13,095	*864* £74,386
Natal	*134* £5,194	*485* £19,988	*539* £24,610	*505* £22,567	*243* £11,369	*684* £34,565	*443* £21,871	*80* £4,394	*181* £10,931	*231* £20,034
Transvaal	*756* £28,981	*1,127* £46,252	*1,179* £52,841	*748* £34,178	*441* £20,119	*825* £36,590	*1,041* £54,710	*108* £5,828	*156* £10,471	*631* £49,363
British India	*439* £18,113	*876* £38,176	*1,182* £55,181	*1,143* £53,003	*880* £38,636	*1,124* £52,602	*196* £9,459	*80* £6,383	*941* £63,700	*3,962* £303,136
Australia	*1,468* £54,176	*2,600* £99,940	*2,646* £109,256	*2,826* £118,877	*1,727* £76,007	*1,282* £57,448	*601* £27,492	*164* £9,060	*535* £35,397	*1,160* £92,165
New Zealand	*2,122* £82,629	*3,094* £120,296	*2,626* £118,735	*2,389* £101,617	*1,852* £74,920	*997* £48,744	*275* £14,440	*65* £3,466	*366* £24,145	*863* £74,669
Other British Possessions	*843* £31,863	*1,175* £50,962	*1,469* £67,239	*1,264* £55,549	*695* £29,002	*1,157* £51,466	*660* £31,662	*407* £20,229	*828* £55,527	*3,453* £262,248
Totals to British Possessions	*6,324* £240,773	*10,656* £430,096	*11,302* £500,768	*9,824* £429,996	*6,291* £271,601	*6,505* £302,859	*3,614* £179,310	*937* £51,119	*3,197* £213,266	*11,164* £876,001
Totals—Exported from United Kingdom	*7,350* £278,856	*13,055* £528,496	*16,850* £733,269	*20,877* £960,473	*10,927* £510,374	*12,847* £594,969	*14,159* £898,254	*5,652* £363,104	*8,368* £577,343	*21,285* £1,668,903

British Tire Exports

	1913	1914	1915	1916	1917	1918	1919	1920	1921	Totals
								177,464		
Argentine Republic	£115,994	£27,064	£54,829	£103,522	£97,110	£116,886	£98,802	£253,355		£867,562
								2,373		
Austria and Hungary								£22,950		£22,950
								203,480		
Belgium	£87,205	£36,031					£168,698	£275,659	£36,354	£603,947
								68,559		
Brazil	£25,521	£17,557	£21,449	£25,389	£20,757	£34,302	£39,449	£84,723	£13,042	£282,189
								699,270		
Denmark	£18,744	£15,520	£43,681	£53,141	£32,012	£715	£109,941	£206,755	£54,002	£534,511
								108,340		
France	£68,071	£61,204	£89,914	£248,398	£178,483	£301,623	£744,235	£473,780	£40,051	£2,205,759
								18,328		
Germany	£33,526	£18,463					£32,189	£144,700		£228,878
								27,058		
Greece							£20,895	£73,639		£94,534
								668,068		
Italy	£33,593	£20,572	£38,964	£86,309	£73,531	£128,655	£186,314	£509,689		£1,077,627
								8,853		
Java					£20,856	£27,924	£22,195	£52,741		£123,716
								7,469		
Morocco							£5,147	£41,692		£46,839
								219,325		
Netherlands	£11,425	£22,927	£30,650	£37,569	£4,858	£77	£120,768	£168,351		£396,625
								170,707		
Norway							£31,879	£68,503		£100,382
								8,017		
Portugal							£50,570	£56,849		£107,419
								145,448		
Russia							£15,753	£101,495	£23,916	£141,164
								65,427		
Spain					£42,710	£36,453	£102,302	£130,412	£63,110	£374,987
								476,880		
Sweden							£66,605	£119,649		£186,254
								40,839		
Turkey							£2,555	£102,741		£105,296
Other Foreign Countries	£72,918	£77,498	£99,107	£184,118	£67,220	£74,541	£134,705	*117,909* £217,624	£673,593	£1,601,333
Total—Foreign Countries	£466,997	£296,836	£378,594	£738,446	£537,546	£721,176	£1,953,002	*3,233,814* £3,105,307	£904,068	£9,101,972
								59,147		
Australia	£16,606	£30,960	£44,068	£61,902	£29,976	£43,210	£25,652	£125,138	£36,721	£414,224
								81,070		
British East Indies	£93,995	£72,934	£74,031	£162,563	£166,566	£203,409	£227,346	£409,680		£1,410,524
								551,225		
British India	£5,275	£6,200	£4,055	£9,634	£47,986	£33,694		£221,205	£176,039	£504,088
								10,442		
British West Africa							£59,768	£58,921		£118,689
									£36,790	£593,004
Cape of Good Hope	£63,190	£52,542	£78,857	£87,984	£199,248	£74,393				
								27,430		
Ceylon and Dependencies								£17,036	£16,131	£33,167
								21,583		
East African Protectorate								£8,182		£8,182
								13,284		
Egypt							£14,738	£65 654	£15,306	£95,698
								18,752		
Gold Coast								£15,980		£15,980
Natal					£77,121	£9,822			£14,943	£101,886
								85,439		
New Zealand	£35,884	£47,397	£73,486	£72,553	£61,127	£89,029	£40,721	£146,296	£35,481	£601,974
								36,805		
Nigeria								£13,472		£13,472
								26,125		
Straits Settlements (Including Labaun)								£18,475	£10,723	£29,198
Transvaal	£39,621	£40,064	£32,775	£73,615	£58,828	£48,627			£26,760	£320,290
								237,482		
Union of South Africa							£74,712	£271,551		£346,263
								57,518		
Other British Possessions	£27,792	£34,858	£59,621	£97,437	£62,190	£93,670	£29,750	£98,213		£503,351
								1,226,302		
Total — British Possessions	£282,363	£284,955	£366,893	£565,688	£703,042	£595,854	£472,687	£1,469,803	£368,894	£5,109,990
Total From Great Britain	£749,360	£581,791	£745,487	£1,304,134	£1,240,588	£1,307,030	£2,425,689	£4,575,110	£1,292,962	£14,211,962

the first three months of the year cannot be obtained.

In 1921 French automobile exports underwent a shrinkage which is not immediately apparent from the official statistics given herewith. The total for the first ten months of the year is 780,858,000 francs, and, on the assumption that the last two months will be equal to the average, the year would show an excess compared with the preceding twelve months. It is necessary to explain, however, that French automobile exports are declared in metric tons, and a value is given to these for statistical purposes only. In 1920 a metric ton was valued at 3000 francs, but quite recently it was decided to reduce this value to 2150 francs. The change in values has been made for the year 1920, but for the first ten months of 1921 the 3000 value has been maintained. When the year is completed and the reduced value is applied, it will be found that the value of French exports has dropped to about 671,000,000 francs, or appreciably less than for the year 1920.

In 1914 the value of a metric ton of automobiles was estimated at 850 francs. This value was successively increased to 1150 francs in 1915, to 1500 francs in 1916 and, finally, to 3000 francs in 1920. The reduction to 2150 francs was decided a couple of months ago, and has been applied to the 1920 figures. The figures for 1921 will not be revised until the totals for the year are available.

The figures given herewith comprise both passenger cars and trucks, but do not cover spare parts, tires or agricultural tractors. The shrinkage is general throughout the series and is particularly noticeable as regards Spain and Portugal. Among the few countries with which there has been an appreciable increase of business are the United States and Roumania. These figures are a reflection of the world depression which marked the year 1921.

Belgian Export

Belgium exported automobiles to the value of 36,623,218 francs during the year 1920, of which 27,177,929 francs were complete cars and 9,445,289 francs represented chassis only. For the first nine months of 1921 the total was 33,237,566 francs. It is necessary to go back to 1913 to get a comparison, for 1914 was interrupted by the war, and in 1919 the Belgian factories had not got completely into production. For 1913 the total volume of business was 32,017,265 francs, representing 1694 complete cars and 1548 chassis without bodies.

Before the war the Argentine was the best client of Belgium, followed very closely by Great Britain. Last year the greatest volume of business was done with England, with Holland second; the South American countries are not even given separately, but are grouped with other countries. In March, 1921, Belgium revised her import duties, adopting a 20 per cent ad valorem duty in place of the old duty based on weight. More recently it was decided to double the duty on German cars. When these changes were made the government department decided to issue grouped export figures for complete cars and chassis, which explains the absence of details for 1921.

For a better understanding of the figures, it is worth while to examine more closely the methods of compilation used by the British government in making up the British automotive export figures. The following explanatory material gives some of the chief factors involved:

For years 1911 to 1918 inclusive, commercial and passenger cars are combined under the title, "Motor Cars

Canadian Exports

Passenger Cars, 1919-1921

Country	1919*	1920*	1921*	Eight Mos. Ending Nov. 1, 1921	Total
Aden	.....	46	58	22	126
	.....	$22,262	$26,524	$8,227	$57,013
Argentine Republic	268	534	356	2	1,160
	$264,482	$609,960	$580,749	$2,139	$1,457,330
Australia	4,080	3,937	3,289	1,820	13,126
	$1,812,690	$2,196,647	$1,724,223	$790,044	$6,523,604
Belgium	.....	1	.....	.....	1
	.....	$1,000	.....	.....	$1,000
Bolivia	27	.....	.....	.....	27
	$24,701	.....	.....	.....	$24,701
Brazil	236	175	28	4	443
	$233,661	$181,304	$44,840	$1,837	$461,642
British Africa	1,149	3,842	2,174	797	7,962
	$557,773	$2,296,509	$1,280,720	$353,368	$4,488,370
British Guiana	.....	2	.....	.....	2
	.....	1,688	.....	.....	1,688
British India	900	4,949	1,557	389	7,795
	$402,361	$2,722,603	$923,771	$171,394	$4,220,129
Ceylon	13	317	168	7	505
	$5,963	$145,751	$96,619	$3,960	$252,293
Chile	81	4	15	2	102
	$92,518	$5,603	$24,578	$1,810	$124,509
China	88	103	79	10	280
	$65,819	$116,212	$127,997	$13,896	$323,924
Denmark	.....	12	.....	.....	12
	.....	$13,218	.....	.....	$13,218
Dutch East Indies	612	1,294	1,662	631	4,199
	$338,241	$695,185	$1,085,654	$270,421	$2,389,501
Dutch West Indies	1	1	.....	.....	2
	$1,189	$1,189	.....	.....	$2,378
Ecuador	6	.....	.....	.....	6
	$7,043	.....	.....	.....	$7,043
Egypt and Soudan	.....	7	.....	.....	7
	.....	$7,694	.....	.....	$7,694
Fiji	14	16	.....	.....	30
	$6,800	$7,089	.....	.....	$13,889
France	4	1	.....	.....	5
	$1,940	$1,500	.....	.....	$3,440
French East Indies	10	9	.....	.....	19
	$8,437	$11,074	.....	.....	$19,511
French West Indies	1	2	.....	.....	3
	$844	$1,688	.....	.....	$2,532
Hayti	.....	5	.....	.....	5
	.....	$5,407	.....	.....	$5,407
Hong Kong	49	7	.....	19	75
	$28,095	$8,954	.....	$32,289	$69,338
Italy	.....	1	.....	.....	1
	.....	$900	.....	.....	$900
Jamaica	.....	1	.....	.....	1
	.....	$500	.....	.....	$500
Japan	162	11	17	4	194
	$140,754	$18,445	$27,232	$4,229	$190,660
Madagascar	6	5	.....	.....	11
	$3,060	$2,216	.....	.....	$5,276
Mexico	.....	4	6	4	14
	.....	$6,250	$9,186	$5,329	$20,765
Morocco	.....	6	.....	.....	6
	.....	$7,878	.....	.....	$7,878
Netherlands	.....	66	55	7	128
	.....	$77,046	$83,091	$7,553	$167,690
Newfoundland	54	38	.....	.....	92
	$29,759	$22,704	.....	.....	$52,461
New Zealand	1,588	2,820	2,326	30	6,764
	$806,775	$1,638,823	$1,448,507	$29,134	$3,923,239
Norway	.....	45	66	.....	111
	.....	$56,938	$107,213	.....	$164,151
Persia	3	.....	.....	.....	3
	$1,530	.....	.....	.....	$1,530
Peru	11	2	6	.....	19
	$14,486	$2,678	$9,150	.....	$26,314
Philippine Islands	.....	9	.....	.....	9
	.....	$10,053	.....	.....	$10,053
Portugal	.....	33	8	1	42
	.....	$42,581	$14,364	$1,559	$58,504
Russia	25	.....	.....	.....	25
	$35,025	.....	.....	.....	$35,025
San Domingo	8	.....	.....	.....	8
	$8,085	.....	.....	.....	$8,085
Siam	60	24	105	62	251
	$31,905	$13,314	$48,740	$25,197	$119,156
Spain	.....	27	51	.....	78
	.....	$33,019	$86,193	.....	$119,212
Straits Settlements	641	978	999	5	2,623
	$312,759	$474,908	$535,047	$4,101	$1,326,815
Sweden	.....	59	36	23	118
	.....	$75,137	$62,862	$13,430	$151,429
Trinidad and Tobago	.....	6	.....	.....	6
	.....	$9,066	.....	.....	$9,066
Turkey	.....	15	.....	.....	15
	.....	$16,806	.....	.....	$16,806
United Kingdom	1,472	807	1,358	404	4,041
	$713,920	$967,465	$1,422,548	$342,017	$3,445,950
United States	52	83	796	88	1,019
	$39,295	$62,463	$1,037,386	$45,977	$1,185,121
Uruguay	.....	69	75	1	145
	.....	$80,538	$122,395	$1,114	$204,047
Other Countries	.....	.....	330	70	400
	.....	.....	$446,689	$47,327	$494,016
Total Passenger Car Exports	11,621	20,373	15,620	4,402	52,016
	$5,989,908	$12,672,265	$11,376,278	$2,176,352	$32,214,803

*Fiscal year, March 1 to March 1.

Truck Exports, 1919-1921

Country	1919*	1920*	1921*	Eight Mos. Ending Nov. 1, 1921	Total
Australia	456	768	867	198	2,289
	$240,307	$351,775	$443,950	$94,553	$1,130,585
British Africa	116	873	443	20	1,452
	$63,793	$420,038	$132,158	$9,066	$625,055
British India	79	724	636	192	1,631
	$37,421	$345,899	$342,438	$90,802	$816,560
Ceylon	3	54	50	.....	107
	$1,680	$26,704	$27,062	.....	$55,446
China	.....	3	.....	.....	3
	.....	$1,391	.....	.....	$1,391
Dutch East Indies	33	278	608	79	998
	$18,095	$128,418	$326,856	$36,414	$509,783
Egypt and Soudan	.....	7	.....	.....	7
	.....	$6,028	.....	.....	$6,028
Fiji	.....	2	.....	.....	2
	.....	$928	.....	.....	$928
Hong Kong	6	.....	.....	.....	6
	$3,071	.....	.....	.....	$3,071
Newfoundland	7	9	.....	.....	16
	$4,020	$6,908	.....	.....	$10,928
New Zealand	512	878	668	.....	2,058
	$289,842	$413,610	$368,699	.....	$1,072,151
Siam	.....	15	.....	12	27
	.....	$6,957	.....	$5,219	$12,176
Straits Settlements	42	81	264	40	427
	$27,018	$39,652	$139,040	$17,886	$223,596
St. Pierre and Miquelon	.....	3	.....	.....	3
	.....	$3,675	.....	.....	$3,675
Turkey	1,306	.....	.....	.....	1,306
	$621,023	.....	.....	.....	$621,023
United Kingdom	.....	425	619	6	1,050
	.....	$426,849	$643,344	$7,184	$1,077,377
United States	7	13	.....	5	25
	$7,500	$32,510	.....	$3,750	$43,760
Other Countries	.....	.....	131	12	143
	.....	.....	$75,556	$12,604	$88,160
Total Truck Exports	2,567	4,133	4,286	576	11,550
	$1,313,770	$2,211,342	$2,499,103	$277,478	$6,301,693

*Fiscal year, March 1 to March 1.

Exports of Tires, 1919-1921

Country	1919*	1920*	1921*	Eight Mos. Ending Nov. 1, 1921	Total
Argentine	$494,509	$366,712	$401,196	$88,818	$1,351,235
Austria	578,765	836,026	802,058	6,240	2,223,089
Belgium	.....	86,824	3,753	.....	90,577
Brazil	.....	76,361	168,160	26,388	270,909
British Africa	99,099	230,541	471,372	53,222	854,234
British Guiana	.....	15,552	22,953	8,967	47,472
British India	55,502	222,787	174,363	53,102	505,754
British West Indies	49,304	57,541	95,816	108,994	311,655
Ceylon	.....	8,406	53,913	10,705	73,024
Chile	.....	43,219	22,441	14,130	79,790
Cuba	164,819	30,385	21,067	1,470	217,741
Denmark	.....	108,244	88,026	31,163	227,433
Dutch East Indies	113,441	160,183	163,230	48,577	485,431
France	.....	245,458	660,136	2,140	907,734
Japan	20,353	138	20,925	24,948	66,364
Netherlands	.....	38,325	75,556	11,061	124,942
Newfoundland	.....	27,150	15,370	1,770	44,290
New Zealand	432,123	607,738	615,346	45,758	1,700,965
Panama	.....	87,289	132,959	12,537	232,785
Peru	.....	18,384	3,974	212	22,570
Spain	.....	161,387	185,974	15,028	362,389
Straits Settlements	.....	37,431	145	.....	37,576
Sweden	.....	33,404	82,471	1,200	117,075
United Kingdom	154,439	3,548,149	3,641,720	754,673	8,098,981
United States	407,162	253,249	179,133	66,183	905,727
Uruguay	.....	59,435	162,711	14,696	236,842
Other Countries	447,458	63,850	181,022	127,190	819,520
Total Tires Exported	$3,016,974	$7,424,168	$8,445,790	$1,529,172	$20,416,104

*Fiscal year, March 1 to March 1.

Automobile Parts, 1919-1921

Country	1919*	1920*	1921*	8 Months Ending Nov. 1, 1921	Total
Argentine Republic	$287,478	$36,933	$1,797	$116	$326,324
Australia	386,277	238,026	474,963	131,829	1,231,095
British Africa	124,887	228,930	369,210	109,344	832,371
British India	225,647	156,276	583,979	40,765	1,006,667
Dutch East Indies	23,055	9,664	96,062	64,108	192,889
New Zealand	89,981	80,401	451,727	12,711	634,820
Straits Settlements	74,388	27,796	246,154	17,525	365,863
United Kingdom	8,708	1,933,265	86,137	78,600	2,106,710
United States	282,273	352,471	1,870,093	106,769	2,611,606
Other Countries	49,602	33,704	82,203	39,365	204,874
Total Parts Exported	$1,552,296	$3,097,466	$4,262,325	$601,132	$9,513,219

*Fiscal year, March 1 to March 1.

French Automobile Exports from 1914 to 1921.

Value of Exports in FRANCS.

	1914	1915	1916	1917	1918	1919	1920	1921 (10 Months)
Great Britain	35,106,800	16,734,800	2,445,000	112,300	1,600	11,539,500	201,098,000	177,564,000
Germany	12,290,300	.....	.....	.....	.....	465,000	7,653,000	11,300,000
Belgium	14,141,400	.....	.....	15,600	.....	12,234,000	162,956,200	197,387,000
United States	1,726,400	3,459,200	1,864,200	150,200	31,200	2,187,000	11,321,100	78,384,000
Argentina	5,843,700	902,800	815,900	289,600	143,500	733,500	12,447,100	8,004,000
Italy	3,751,600	6,052,100	3,836,300	1,007,800	897,900	4,539,000	16,309,900	3,258,000
Switzerland	3,253,900	505,200	362,600	739,600	487,400	2,791,500	27,004,200	30,863,000
Spain	5,267,000	4,574,400	2,910,700	766,600	396,200	27,025,500	166,006,100	72,579,000
Egypt	587,300	392,900	196,600	32,800	14,000	153,000	4,995,100	6,124,500
Mexico	393,100	13,800	.....	.....	.....	3,000	5,902,600	3,376,500
Brazil	2,230,700	294,400	232,400	48,300	12,500	.....	7,892,000	3,526,500
Russia	3,559,800	24,455,800	62,308,000	0,842,700	.....	3,255,000	1,125,500	73,500
Holland	50,800	1,068,400	53,000	.....	.....	2,001,000	5,830,900	8,524,500
Portugal	2,093,000	1,108,000	657,200	205,100	218,400	5,170,500	13,655,700	5,365,500
Austria	654,500	.....	.....	.....	.....	.....	266,300	669,000
British India	350,700	1,307,600	17,200	39,000	.....	141,000	6,292,700	4,840,500
Denmark	95,500	378,900	199,700	.....	.....	1,401,000	6,586,200	3,289,500
Chili	1,054,800	471,800	298,000	.....	73,300	54,000	1,337,400	2,403,000
Turkey	1,267,200	.....	.....	.....	.....	448,900	3,573,700	8,821,500
Uruguay	96,900	62,100	65,600	.....	.....	606,000	3,445,100	592,500
Roumania	395,300	82,800	4,154,100	9,310,100	.....	2,637,000	5,128,500	13,782,000
Colombia	270,200	66,000	12,200	.....	.....	.....	473,000	165,000
Australia	522,800	136,900	109,200	.....	.....	.....	187,000	711,000
Canada	203,400	.....	.....	.....	.....	.....	182,700	117,000
Dutch Indies	.....	621,600	.....	.....	.....	.....	668,700	810,000
Other Countries	9,664,100	3,295,160	3,664,183	1,263,040	992,290	3,133,100	39,727,885	63,584,000
French Colonies	18,642,950	3,781,380	4,335,870	1,460,100	854,490	43,990,500	171,633,205	74,743,000
Total	123,514,250	69,766,040	88,537,953	36,283,740	4,122,780	124,509,000	883,699,790	780,858,000

under the one title, "Motor Cars."

In the several reports compiled a total for the several years will be noticed for the individual countries. This is not a true total of the automotive exports for the individual country except where there are complete figures for each year from 1911 to 1920, inclusive. The total is given

Italian Automobile Imports

For Years 1920 and 1921

COUNTRY	NUMBER OF CARS	
	1920	1921 (6 Months)
Austria	84	52
France	740	49
Germany	75	51
United States	564	13
Other Countries	92	23
Total	1555	188

BELGIAN AUTOMOBILE EXPORTS

1919, 1920 and first nine months of 1921

VALUE IN BELGIAN FRANCS

Country	Complete Cars				Chassis Only				Complete Cars and Chassis	
	1919		1920		1919		1920		1921 (9 months only)	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Great Britain	38	541,400	352	7,294,600	3	51,000	256	3,853,775	221	6,768,396
Holland	48	463,000	225	3,994,846	..	.....	..	.....	178	4,651,499
France	17	324,000	95	1,721,702	7	85,800	62	857,332	82	1,875,073
Spain	11	212,000	127	3,249,500	..	.....	..	.....	92	3,604,600
Portugal	7	125,000	134	2,551,957	..	.....	..	.....	14	638,000
Germany	3	55,000	7	66,350	..	.....	20	674,500	54	1,777,000
Italy	..	.....	2	86,000	..	.....	7	75,575	..	.....
United States	..	.....	4	85,000	..	.....	3	74,000	19	737,000
Other Countries	26	391,470	253	8,127,974	34	282,325	191	3,910,107	345	13,185,998
Total	150	2,111,870	1199	27,177,929	44	419,125	539	9,445,289	1005	33,237,566

Italian Car Exports

Country	1914	1915	1920	1921 (6 months)
Belgium	17	71	608	353
Denmark	1	4	143	10
France	210	374	451	282
Great Britain	985	684	3,068	1,301
Greece	73	31	106	241
Norway	16	24	172	51
Holland	41	21	283	80
Portugal	22	8	189	26
Spain	36	51	1,198	485
Switzerland	219	37	983	559
Turkey	37	....	363	8
British India	48	84	568	225
Australia	157	194	142	343
Algeria	2	....	227	13
Egypt	3	1	279	127
Argentine	131	35	332	225
Brazil	35	12	214	99
United States	217	163	209	151
Other Countries	1,041	691	1,785	1,180
Total	3,291	2,485	11,320	5,759

(Complete)." For 1919 and 1920 the cars were divided under the titles "Touring Cars (Including Cabs)" and "Commercial Vehicles (Including Motor Fire Engines, Motor Ambulances)." All motor car and truck figures have been combined in compiling the report herewith so that it will be possible to obtain a general idea as to the relative quantity of the imports from the United Kingdom.

It is interesting also to note the varying trend in exports from the different countries, as noted by the rise and fall in value of particular export markets. This trend is sometimes quite marked over a limited period of time, as, for instance, in the figures reported to the Automotive Division of the Department of Commerce by Commercial Attache Tower at London show the trend of passenger cars exported during November, 1921, to have been toward British dominions, colonies and possessions, and of commercial cars toward foreign countries.

German Automotive Exports, May to September, 1921

Country	Cars and Chassis (Kilograms)	Parts (Kilograms)	Tires (Kilograms)	Motorcycles (Number)
Austria	150,300	235,600	.....	.....
Belgium	250,600	41,000	.....	.....
Central America	34,100	1,800	.....	.....
Czecho Slovakia	.....	.....	100,700	.....
Dantzig	.....	.....	54,100	.....
Denmark	380,700	51,900	83,000	261
Finland	236,400	9,300	.....	.....
France	3,000	2,500	.....	.....
Great Britain	388,100	13,800	.....	.....
Hungary	.....	.....	28,300	.....
Italy	24,100	101,700	10,600	.....
Netherlands	943,700	60,700	123,600	252
Norway	140,100	6,200	.....	.....
Portugal	28,000	2,700	.....	.....
Saar District	.....	.....	48,500	.....
South America	167,900	13,900	15,200	.....
South East Asia	267,100	9,400	37,200	.....
Spain	491,900	32,500	.....	.....
Sweden	415,800	28,600	.....	44
Switzerland	345,800	40,100	87,200	123
United States	352,700	23,000	.....	.....
Other America	77,700	.....	.....	.....
Other Countries	1,291,800	143,210	207,800	387
Total Exports	5,989,800	817,910	796,200	1,067

Automotive Products Imported Into Great Britain, 1920-21

	NUMBER		VALUE IN POUNDS	
	1920	1921	1920	1921
Cars and Cabs	24,055	5,138	7,334,339	1,294,020
Trucks of all kinds	9,277	2,298	3,148,146	525,092
Chassis of Cars and Trucks	12,106	4,071	4,254,949	1,090,370
Motorcycles and Tricars	4,305	2,171	285,820	66,513
Parts of Cars and Trucks	.....	.....	8,709,846	2,922,642
Parts of Motorcycles and Tricars	.....	.....	121,539	123,212
Tires and Tubes	.....	.....	5,577,061	4,086,078

General Automotive Statistics

The Trend of the Petroleum Industry in 1921

Basic need for automotive transportation is again emphasized by the fact that the total yearly consumption of gasoline increased in spite of the prevailing business depression. Better refinery practice in recent years has resulted in higher ratio of gasoline recovered to crude oil refined.

Joseph E. Pogue[1]

ONE of the most remarkable industrial features of the year just closed—a year of almost unprecedented depression in business—was the fact that the consumption of gasoline in the United States increased about 6 per cent over the preceding year.[2] Those who had any doubt about the basic character of automotive transportation must have been surprised by this growth so at variance with the course of practically all other activities. In the presence of world-wide industrial stagnation this fact should stand out as a clear beam of light to the automotive industry and the petroleum industry alike.

The 6 per cent increase in gasoline consumption, it is true, represents a slowing down in the rate of increase that has characterized the past few years, inevitably so under the conditions. But the supply of crude petroleum, curiously enough, went on increasing at its accustomed geometric rate, and in consequence more oil became available than current needs could absorb. Thus, as the year wore on, the price of crude petroleum fell to substantially a pre-war level and, in spite of an unequaled demand for gasoline, the petroleum industry traversed the valley of depression along with the rest of the industries of the country. Had the petroleum industry been able to cut its production to the measure of demand, an easier journey through the dark months would doubtless have been the result.

The broad features of the crude petroleum situation in 1921, as contrasted with 1919 and 1920, are graphically shown in Fig. 1. Domestic production increased, but not so much as in 1920. Imports from Mexico likewise were greater, though to a less degree than in the previous year. On the other hand, the consumption of crude petroleum was less and the surplus went into storage. But how could our consumption of crude petroleum decline when, as just noted, the demand for gasoline increased? The answer is of outstanding importance to the automotive industry. In 1920, the ratio of gasoline production to crude petroleum consumption was 19.9 per cent, while in 1921, the ratio rose to 23.4 per cent; that is to say, the growth of technology supported an increase in motor fuel service on a decreased consumption of crude. This factor, though not absolutely needed in 1921, nevertheless was operative and represents the mainstay of the future in the event of a lagging supply of crude petroleum.

A more detailed view of the development of the crude petroleum situation is afforded by Fig. 2, where the principal factors are shown on a monthly basis over the past three years. The most striking features are the violent sag in price and the large imports, falling to a low point in August, but reaching unusual heights again in the fourth quarter of the year.

The imports are all from Mexico, and the productivity of the Mexican oil fields plays an important part in the petroleum supply of the United States. The serious inroads of salt water in the largest pools in Mexico have been discussed rather fully in an earlier article in this journal.[3] According to the best available information, the life of the known field in Mexico is limited, and the output of that country will shortly be considerably reduced pending the development of new productive areas,

[1] Consulting Engineer, New York.

[2] The statistics presented in this review were derived from the following sources: Data on crude petroleum from U. S. Geological Survey and American Petroleum Institute; refined products from U. S. Bureau of Mines; well data from *Oil and Gas Journal;* export figures from U. S. Bureau of Foreign and Domestic Commerce; prices calculated by the writer from quotations given in the *National Petroleum News,* and *The Oil, Paint, and Drug Reporter.*

[3] AUTOMOTIVE INDUSTRIES, Dec. 29, 1921, pp. 1254-1256. See also Pogue, The Economics of Petroleum, New York, 1921, pp. 18-21.

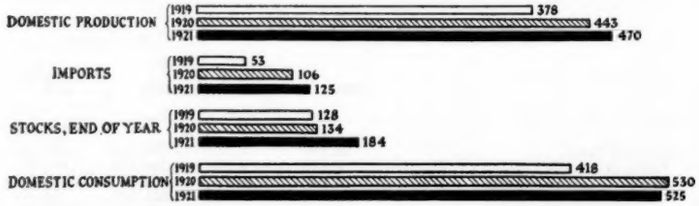


Fig. 1—Comparative views of the principal factors in the crude petroleum situation over the past three years, in millions of barrels

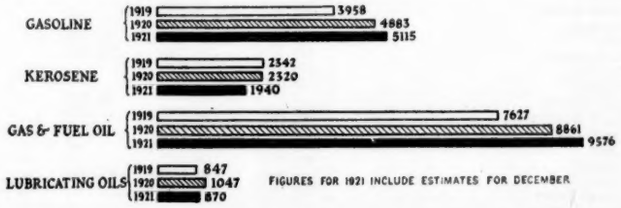


Fig. 5—Comparative view of the production of the principal petroleum products over the past three years, in millions of gallons

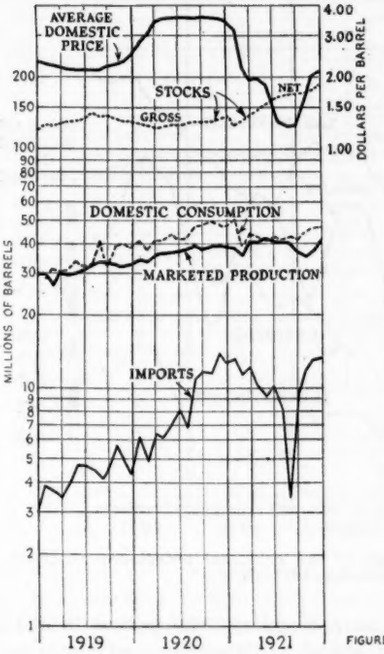


Fig. 2—Trend of the crude petroleum situation by months, 1919-1921

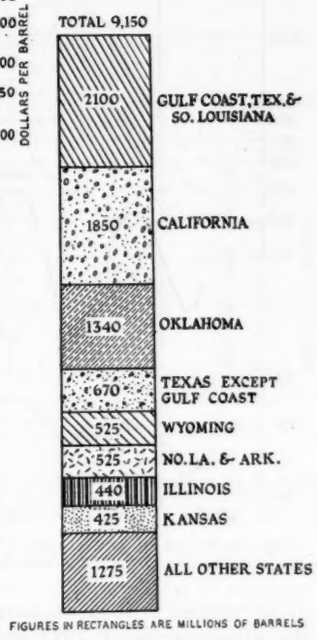


Fig. 3 — Distribution of the unmined supply of crude petroleum in the United States on January 1, 1922, according to inventory recently completed by the U. S. Geological Survey and the American Association of Petroleum Geologists

which, of course, will take time.

During 1921, domestic production of crude petroleum failed to increase as sharply as during 1920, although the closing months of the year saw the bringing in of a large number of gushers, particularly in the new Mexia field in central Texas. Although drilling was strongly curtailed by the decline in crude oil prices, the effect of fewer wells was offset by the large average size of the new wells brought into production. It seems that some of the most productive oil territory in the United States was penetrated by the drill in 1921.

During 1921 the United States Geological Survey, in co-operation with the American Association of Petroleum Geologists, made an exhaustive analysis of the unmined supply of crude petroleum in the United States. Using the same methods for estimating the national resource that are employed by all progressive oil companies for appraising the value of oil properties, the joint committee estimated that 9,000,000,000 barrels of oil recoverable by methods now in use remained in the ground in this country on Jan. 1, 1922. The distribution of this reserve is shown in Fig. 3, where it may be observed that 58 per cent of the total is allotted to Oklahoma, California, and coastal Texas and Louisiana. The oil reserve has been previously estimated by the Geological Survey; the previous appraisal made in 1918 is increased by nearly 70 per cent, but the total still looks small when compared with our annual draft now fast approaching the half billion point.

TABLE 1—TREND OF THE CRUDE PETROLEUM SITUATION

(In millions of barrels)

	Domestic Production	Imports	Stocks End of period	Domestic Consumption	Average price $ P. Bbl.
By Years					
1913	248	17.8	123	262	$1.14
1914	266	17.2	142	261	.93
1915	281	18.1	164	273	.75
1916	301	20.6	162	319	1.33
1917	335	30.2	146	378	1.77
1918	356	37.7	122	413	2.22
1919	378	52.8	128	418	2.25
1920	443	106.2	134	530	3.44
1921	470	125.3	184	525	1.86
By Months 1921					
Jan.	37.9	13.2	124	48.3	3.28
Feb.	35.3	11.4	131	39.3	2.19
Mar.	41.0	12.3	138	45.2	1.98
Apr.	40.1	10.0	145	42.5	2.00
May	42.0	9.1	154	41.5	1.81
June	40.4	10.2	161	42.8	1.45
July	40.3	8.0	167	41.5	1.28
Aug.	41.0	3.4	168	42.6	1.25
Sept.	36.6	9.1	171	41.7	1.25
Oct.	35.6	11.6	173	45.2	1.63
Nov.	37.9	13.0	176	46.1	2.07
Dec.	42.0	13.8	184	47.8	2.10

TABLE 2—TREND OF THE PRODUCTION OF THE PRINCIPAL PRODUCTS OF PETROLEUM

(In millions of gallons)

	Gasoline	Kerosene	Gas and Fuel Oil	Lubricating Oils
By Years				
1914	1500	1935	3734	517
1915	....	....	....	...
1916	2059	1455	4664	625
1917	2851	1727	6513	754
1918	3570	1825	7321	841
1919	3958	2342	7627	847
1920	4883	2320	8861	1047
1921[a]	5115	1940	9576	870
By Months 1921				
Jan.	460	205	837	86
Feb.	388	163	733	72
Mar.	420	169	758	73
Apr.	426	156	813	76
May	449	145	817	70
June	430	142	826	63
July	420	139	807	66
Aug.	432	144	784	66
Sept.	417	154	788	69
Oct.	441	182	834	76
Nov.	432	175	799	77
Dec.	...	...	...	..

[a]December estimated.

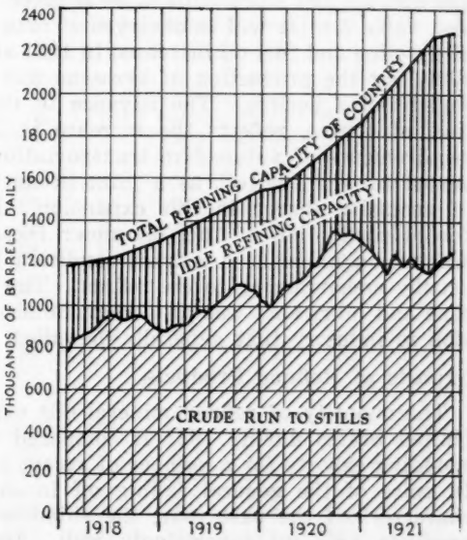


Fig. 4 — Refinery activity in the United States by months, 1918-1921, showing the proportion of the refinery capacity utilized

The present appraisal undoubtedly carries sufficient precision to warrant its careful consideration by everyone interested in the future of automotive transportation.

Refining Activity

The aggregate activity of the refineries of the country fell away during 1921 from the vigor displayed during the closing months of 1920, as illustrated in Fig. 4. The

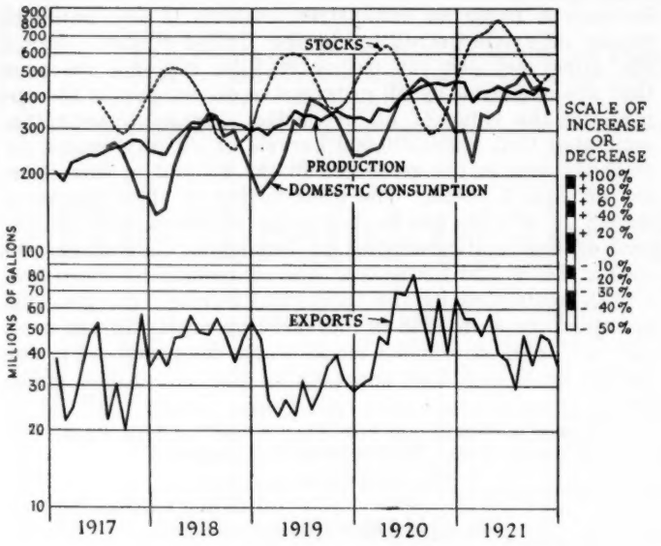


Fig. 6—Trend of the gasoline situation by months, 1917-1921.

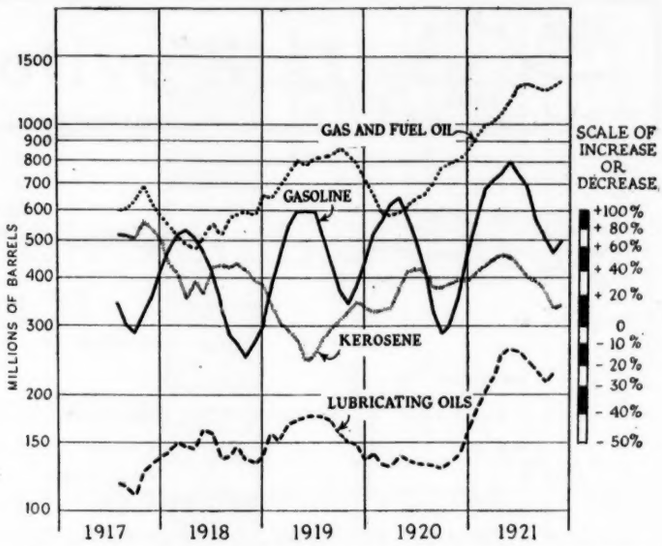


Fig. 7—Trend of the stocks of the principal petroleum products by months, 1917-1921.

decline, however, was moderate in comparison with the recession characteristic of almost all other productive enterprises. A considerable capacity of new stills, inaugurated during 1920, came to a head in 1921, so that the idle refinery capacity toward the close of 1921 was nearly double that of the previous year. Fig. 4 throws these facts into perspective and suggests the degree to which the total refinery capacity of the country has in recent years run in advance of our consumptive requirements. It should be noted, however, that much of this surplus capacity consists of incomplete refineries of the skimming or topping variety; that is, refineries which confine their efforts primarily to the manufacture of fuel oil and gasoline.

Output of Refined Products

A comparative view of the domestic production of the principal products of petroleum—gasoline, kerosene, gas and fuel oil, and lubricating oils—is given in Fig. 5. (See also Table 2.) It will be observed at once that the output of gasoline and fuel oil increased in 1921 as compared with 1920, but the production of kerosene and lubricating oils registered a decline. The advance in the case of gasoline, of course, reflects the increase in the consumptive requirements of automotive transportation previously adverted to, and fuel oil, as a joint product with gasoline, of necessity shared in this expansion. In fact, the enforced production of fuel oil under these circumstances created an unbalanced market condition that proved unusually embarrassing to the refiner. The decline in kerosene and lubricants was an accompaniment of the depression in industry that generally prevailed.

Exports of Refined Products

The quantity of refined mineral oils exported from the United States during 1921 is compared with the corresponding exports for a number of recent years in Table 3. In spite of the general falling off in export trade that characterized the past year, the shipments of petroleum products held up surprisingly well. Gasoline consignments, though a little below the attainments of 1920, nevertheless compared favorably with the preceding years. The same statement is essentially true of kerosene. Fuel oil, on the other hand, showed a slight advance over 1920, though the aggregate shipments of this commodity naturally did not approach the huge exports during the war years of 1917 and 1918. When we come to lubricating oils, however, a sharp decline as compared with 1920 is to be noticed, but as measured against the period 1913-19, the attainments of 1921 stand a little ahead of the average. In spite of the economic demoralization of foreign countries during 1920, it would appear that a surprisingly large demand for the products of petroleum manifested itself. The obvious conclusion would be that industrial activity in some of the countries abroad was not as stagnant during 1921 as the demoralized status of foreign exchange might lead one to suspect.

The Gasoline Situation

The trend of the gasoline situation by months during 1921 is pictured graphically in Fig. 6, on which the data for four preceding years have been entered to give perspective. The chart represents a record of this commodity for the entire period during which detailed statistics are available. One would probably be safe in stating that the chart of no other commodity would display so slightly the effect of the industrial depression in 1921. A close examination of Fig. 6, it is true, will reveal a slight lagging in the rates of growth of the several factors de-

TABLE 3—TREND OF THE EXPORTS OF THE PRINCIPAL PRODUCTS OF PETROLEUM
(In millions of gallons)

	Gasoline	Kerosene	Gas and Fuel Oil	Lubricating Oils
By Years,				
1913	188	1119	427	208
1914	210	1010	703	192
1915	282	837	812	240
1916	356	855	964	261
1917	416	658	1124	280
1918	559	491	1201	257
1919	372	979	618	275
1920	635	862	847	411
1921	533	749	854	289
By Months 1921				
Jan.	55	79	110	38
Feb.	54	68	73	30
Mar.	47	64	69	15
Apr.	57	59	72	23
May	41	52	51	17
June	39	64	62	15
July	29	36	77	19
Aug.	48	56	77	19
Sept.	37	55	86	21
Oct.	47	73	70	32
Nov.	46	76	41	28
Dec.	36	66	70	35

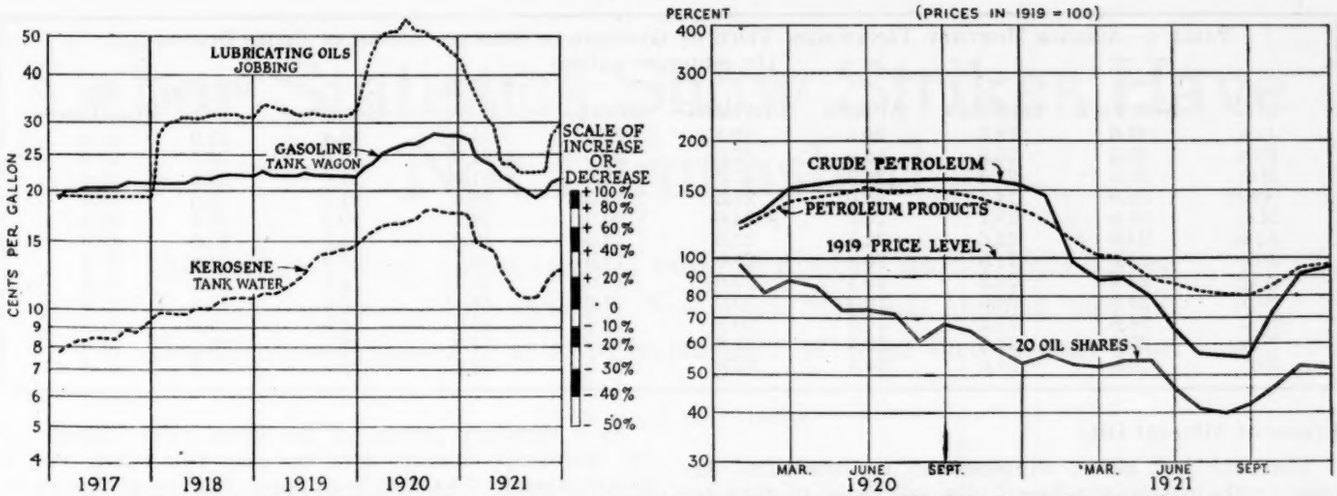


Fig. 8 (Left)—Price trend of gasoline, kerosene, and lubricating oils by months, 1917-1921. Fig. 9 (Right)—Trend by months, 1920-1921 of (a) the weighted average price of crude petroleum, (b) the weighted average price of the principal petroleum products, and (c) the average price of 20 oil shares

picted, but in a year of sharp industrial curtailment in all other directions, the mildness of the reaction in respect to gasoline is indeed striking.

The course of gasoline stocks during 1921 should receive special notice. The volume of this commodity in storage slightly exceeded its normal trend in midsummer, and toward the close of the year failed to decline quite to the normal level for that period. But the accumulation was not excessive, and we are far from entering the present year with a gross over-supply of gasoline.

Endpoint of Gasoline

In July, 1921, the U. S. Bureau of Mines conducted its fourth semi-annual motor gasoline survey, collecting and analyzing 115 samples of commercial gasoline representing a sampling of the entire country. The investigation, summarized in Table 4, showed that the gasoline marketed in July, 1921, was almost identical in volatility with

TABLE 4—ENDPOINT OF MOTOR-GASOLINE IN SELECTED CITIES IN RECENT YEARS
Data from U. S. Bureau of Mines
(In degrees Fahrenheit)

	1919	1920		1921	
	April	Jan.	July	Jan.	July
New York	411	418	432	417	422
Washington	426	439	449	439	442
Pittsburgh	425	425	454	430	435
Chicago	423	445	455	439	444
New Orleans	435	424	445	428	427
Salt Lake City	441	440	456	439	401
San Francisco	374	406	428	417	421
Average	417	427	446	429	427

that on sale in January, 1921, and considerably more volatile than the average product in use the preceding summer. These results, indeed, were easily predictable from the fact that the supply of gasoline in 1921 was ample and there was no commercial need to amplify the supply by raising its endpoint. The fact seems by now well established that the volatility of gasoline is a function of the relationship between supply and demand. In years when demand is crowding supply the endpoint tends to rise, while under reversed conditions the volatility of this product improves.

Stocks of Petroleum Products

An epitome of oil conditions is afforded by a view of the changing quantity of refined mineral oils in storage in the United States. Such a view may be obtained from Fig. 7, where the stocks are plotted on a monthly basis for the entire period covered by detailed statistics. The striking feature of the chart is the large accumulation of fuel oil and lubricating oils in storage during 1921, both of these commodities more than doubling in volume. Here we have considerable evidence of the unbalanced range of demands that faced the petroleum refining industry throughout the whole year. To meet the requirements for gasoline, the product in strongest demand, the refineries over-produced in respect to fuel oil and lubricants.

Examining the 1921 trace of the curves in greater detail, we observe that the stocks mounted sharply during the first four or five months of the year, then declined for a period, and toward the close of the year started to increase again. With due allowance for seasonal changes that repeat with regularity from year to year, this course reflects the improvement in industry that came in the fall, but which was succeeded toward the end of the year by a general slackening and tendency toward reaction.

TABLE 5—INDEX NUMBERS OF THE AVERAGE PRICE OF CRUDE PETROLEUM AND ITS PRINCIPAL PRODUCTS
(Average prices in 1913 = 100)

	Gasoline	Kerosene	Fuel Oil	Lubricating Oils	Petroleum[a] Products	Crude Petroleum	All[b] Commodities
By years							
1913	100	100	100	100	100	100	100
1914	83	97	85	101	89	82	100
1915	75	90	68	97	80	66	101
1916	121	101	98	119	114	117	124
1917	132	108	147	126	130	155	176
1918	139	130	189	200	161	195	196
1919	142	162	149	209	159	197	212
1920	170	217	262	318	225	302	243
1921	143	164	122	179	150	163	177
By months 1921							
Jan.	177	222	181	251	200	288	177
Feb.	160	189	135	218	176	192	167
Mar.	154	186	131	202	164	174	162
Apr.	151	178	131	194	160	176	154
May	141	160	116	154	142	159	151
June	137	146	102	154	137	127	148
July	132	137	96	148	131	112	148
Aug.	129	137	97	148	129	110	152
Sept.	126	137	97.5	148	128	110	152
Oct.	129	150	124	149	135	143	150
Nov.	137	162	137	184	151	182	149
Dec.	140	163	118	195	152	184	149

[a]Weighted average of gasoline, kerosene, fuel oil and lubricating oils.

[b]From U. S. Bureau of Labor Statistics.

TABLE 6—AVERAGE MONTHLY TANKWAGON PRICE OF GASOLINE IN SELECTED AMERICAN CITIES DURING 1921
(In cents per gallon)

1921	New York	Baltimore	Atlanta	Cleveland	Chicago	Kansas City	Houston	Salt Lake City	San Francisco
Jan.	31.0	28.3	29.0	29.8	26.6	24.9	25.4	32.0	27.0
Feb.	28.5	25.8	28.0	27.3	23.0	21.0	22.0	26.5	27.0
Mar.	26.5	24.5	26.3	27.0	23.0	21.0	21.0	28.0	25.0
April	26.0	24.5	26.0	26.3	22.3	20.4	21.0	28.0	25.0
May	26.0	23.7	26.2	24.6	20.0	18.7	20.2	27.2	23.8
June	24.6	22.0	22.5	22.8	19.5	18.2	14.3	27.0	23.0
July	24.0	21.5	20.8	21.0	18.0	16.7	14.0	24.8	23.0
Aug.	24.0	20.2	20.4	20.0	18.0	16.1	14.2	24.0	21.4
Sept.	24.0	20.5	20.3	20.0	17.0	15.7	15.0	24.0	21.0
Oct.	24.6	21.4	20.8	20.2	17.6	15.9	16.0	24.0	21.0
Nov.	25.8	23.5	23.3	21.8	19.1	17.8	18.8	25.1	21.0
Dec.	26.8	24.0	24.5	22.0	19.5	18.2	19.5	25.5	21.0

Prices of Mineral Oils

The year just closed witnessed an unprecedented decline in the prices of mineral oils, succeeded in turn by a sharp upward movement in the fall. The course of oil prices may be ascertained from Table 5 and Fig. 8. It is evident that oil prices followed the course of prices in general, though falling lower in midsummer than the average price level of all commodities, and in part rising above this level during the closing months of the year. In terms of pre-war prices taken as 100, crude petroleum ended the year at 184; gasoline, at 140; kerosene, at 163; fuel oil, at 118, and lubricating oils, at 195. By way of comparison, the average price of raw materials in the United States in December, 1921, according to calculations made by the Federal Reserve Board, was 140; of producers' goods, 127; of consumers' goods, 140.

The monthly price courses, 1917-21, of the oil products of chief interest to the automotive industry are shown graphically in Fig. 8, where the downward and upward movements during 1921 are thrown into perspective. The price of gasoline, as usual, was more stable than the prices of kerosene and lubricants, although gasoline definitely accommodated itself to the change in price level that affected all commodities. Prices in 1921, as shown by the chart, should be especially compared with prices in 1920. In general terms, the year just closed neutralized the price advances of 1920, leaving the price levels at approximately their 1919 heights.

To those interested in local gasoline prices, Table 6 will reflect the average monthly tank-wagon price of gasoline during 1921 in a number of cities selected so as to give a sample of the entire country. There was a fairly uniform price movement for this commodity throughout the whole country, illustrating its responsiveness to changing economic conditions both in the petroleum industry and outside.

As a summary picture of the broad price changes in the petroleum industry over the past two years, Fig. 9 is introduced. The most significant feature of this chart is the manner in which the stock market anticipated the price changes in crude petroleum and petroleum products.

Conclusions

The developments in the petroleum industry during 1921 of special interest from the automotive viewpoint may be summarized as follows:

(1) Domestic production of crude petroleum increased during 1921 in spite of drastic curtailment of industrial activities in practically all other directions.

(2) In the face of a notable decline in the number of oil wells completed, the aggregate output of the country became increasingly dependent upon flush production.

(3) The Mexican oil fields were exploited with unprecedented intensity, and many of the individual pools were exhausted during the year.

(4) Refinery activity slowed down, though not in keeping with industrial activities in general.

(5) The domestic consumption of gasoline increased about 6 per cent over the previous year.

(6) The prices of crude petroleum and its principal products suffered a precipitous decline during the first part of the year, but from September on recovered part of the ground lost.

(7) The closing week of the year registered the largest daily production of crude petroleum that this country had thus far enjoyed.

(8) An inventory of the unmined supply of crude petroleum, made by the U. S. Geological Survey and the American Association of Petroleum Geologists placed the unmined reserve at 9.1 billion barrels.

(9) The present year opens with nearly 50 per cent of the total crude petroleum output of the country coming from wells less than a year old.

TWENTY-NINE gallons of fuel oil are wasted for every ton of steel that is produced, according to the statement of William N. Best, the petroleum engineer in his new book on "Burning Liquid Fuel," recently published by the U. P. C. Book Company.

The book contains much interesting statistical and technical data, and covers in a thorough and comprehensive manner the various phases of the science of burning liquid fuel. Especially interesting is the table of crude petroleum produced through the world since 1857 in the various countries of the world. The table shows the following production for the period 1857-1918 inclusive.

Country	Bbls. of 42 Gal.	Percentage of Total
United States	4,608,571,719	61.41
Mexico	285,182,489	3.80
Russia	1,873,999,199	24.97
Dutch East Indies (a)	188,388,513	2.51
Rumania	151,408,411	2.02
India	106,162,365	1.41
Persia	14,056,063	.19
Galicia	154,051,273	2.05
Peru	24,414,387	.33
Japan and Formosa	38,498,247	.51
Trinidad	7,432,391	.10
Egypt	4,848,436	.07
Argentina	4,296,093	.06
Germany	16,664,121	.22
Canada	24,425,770	.33
Venezuela	317,823	.02
Italy	973,671	
Cuba	19,167	
Other Countries	397,000	
Total	7,504,107,138	100.00

Labor Statistics Show Strikes Have Not Diminished

Opposition to wage decreases chief cause of disputes during 1921. First 9 months produce 2,200 strikes. New York State has greatest number. Definite trends shown in relative importance of wage factors each year.

By Norman G. Shidle

STATISTICAL data regarding labor is usually such as relates to the difficulty workers have brought to industry in the way of strikes and industrial disputes. It should be recognized, however, that the figures which appear under the title of "labor statistics" are really only a part of the picture. In a certain sense the production figures of an industry are just as much "labor statistics" as are the records of strikes and lockouts.

The 1921 labor statistics show a continuance of the large number of strikes, despite industrial depression.

Two thousand two hundred strikes occurred the first 9 months of 1921. A rather broad estimate places the number of men involved in these strikes over a million and the number of days lost by factories because of the strikes at something like 50,000.

Statistics concerning labor in the United States do not provide the sort of fundamental data essential to any thorough analysis of our industrial problems. When the Department of Commerce recently took up matters of unemployment, it failed to find any adequate data available anywhere in government bureaus upon which to base sound studies of the practical problem it was approaching.

There is a very definite value, however, attached to the labor statistics compiled by the Bureau of Labor Statistics of the Department of Labor, provided they are properly analyzed and interpreted. The figures used here are either reprinted directly from the tables compiled by the Bureau or are the result of compilations based upon the work of the Bureau. The figures relating to 1921 are for 9 months only in every case, and slight variations may be expected when the final totals for the year are compiled.

In the very nature of things, it is impossible to discuss the really fundamental factors of industrial relations merely by the use of statistics concerning strikes, wages and cost of living. Being essentially a study of the psychology of the individual and an analysis of the individual in his relation to his task, the industrial relations problem lends itself less than any other industrial question to statistical treatment.

A study of the available statistics, however, enables the executive to sense certain broad general trends, to learn the present and probable future status of industrial unrest so far as it relates to the more virulent forms, such as strikes and lockouts, and to interpet, in the light of these general movements, the most effective methods for use in handling his own individual problems.

The necessity for constructively studying the problems of human relationships in industry is made even more apparent by the recent remark of a highly respected and conservative cabinet member, who said: "There is in the United States a well-defined and constantly growing unrest which already embraces probably 75 per cent of our population. This unrest is manifesting itself in the form of a discontent with any social system which permits widespread unemployment and physical privations in a country so abundantly blessed with natural resources as the United States."

Here is the statement of a man whose opinion on this subject undoubtedly has the respect of every reader of

PRINCIPAL CAUSES OF STRIKES AND LOCKOUTS 1916, 1917, 1918, 1919, 1920, AND FIRST THREE-QUARTERS OF 1921
(Approximate Percentages)

Matter in Dispute	STRIKES						LOCKOUTS					
	1916 per Cent	1917 per Cent	1918 per Cent	1919 per Cent	1920 per Cent	1921 per Cent	1916 per Cent	1917 per Cent	1918 per Cent	1919 per Cent	1920 per Cent	1921 per Cent
For increase of wages	35.10	35.60	42.50	30.42	42.33	4.5	10.57	13.50	13.49	19.86	17.24	2.08
Because of decrease of wages	1.00	0.80	1.07	2.46	3.93	43.6	1.84	1.59	1.93	2.48	18.97	12.50
Non-payment of wages	0.35	0.40	0.98	0.28	0.64	....	.....	0.79	.....	.....	.....	.....
Because of increase of hours	0.08	0.40	0.19	0.25	0.22	1.7	2.67	.....	.....	.....	.....	.....
For decrease of hours	3.02	2.89	2.48	3.26	1.99	12.4	1.84	3.97	.....	6.60	.....	14.58
For increased wages and decreased hours	13.04	8.80	7.80	17.01	8.43	1.2	1.84	3.17	1.93	7.43	5.17	.....
Recognition of union	9.36	6.50	5.84	11.31	3.64	1.1	20.20	31.00	33.60	25.65	8.62	12.50
Recognition and wages	3.32	3.50	3.00	3.91	2.64	1.2	1.84	3.97	1.93	4.14	6.90	2.08
Recognition and hours	0.60	0.64	0.50	0.59	0.16	....	0.92	0.79	.....	0.83	1.72	.....
Recognition, wages and hours	1.85	1.32	2.08	5.49	1.32	0.3	4.59	.....	.....	5.79	5.17	.....
Recognition and conditions	.....	0.30	0.22	0.44	0.19	.....	.....	.....	.....	.....	.....	.....
General conditions	1.58	2.25	1.70	1.76	2.39	2.3	.....	3.17	1.93	.....	.....	2.08
Conditions and wages	1.52	1.65	1.57	1.66	1.71	0.5	1.84	0.79	1.93	0.83	5.17	2.08
Conditions and hours	0.08	0.40	0.06	0.05	0.06	.....	.....	0.79	.....	.....	.....	.....
Conditions, wages and hours	0.68	0.61	0.25	1.14	1.38	.....	.....	.....	.....	.....	.....	.....
Discharge of foreman demanded	0.46	0.88	1.67	0.46	0.96	.....	.....	0.79	.....	.....	.....	.....
Because of discharge of employees	3.32	4.80	4.30	4.35	4.48	2.0	4.59	2.38	.....	.....	.....	.....
Employment of non-union men	2.00	1.80	1.92	.....	1.19	1.3	3.67	0.77	.....	.....	.....	6.25
Relative to agreement	1.03	1.77	1.29	1.01	1.64	3.8	1.84	2.38	.....	3.31	5.17	4.17
New agreement	1.01	0.52	0.12	1.11	0.35	1.9	2.75	1.59	.....	.....	.....	2.08
Sympathy	0.87	1.61	1.07	3.08	2.04	1.3	0.92	0.79	0.97	.....	.....	.....
Jurisdiction	0.52	0.47	0.50	0.46	0.64	0.4	....	.....	.....	0.83	.....	.....
Miscellaneous	3.18	4.09	5.34	2.80	10.47	12.8	2.75	3.97	8.70	12.41	10.35	12.50
Not reported	16.00	18.00	13.55	6.60	7.20	7.7	30.30	23.80	33.60	9.99	15.52	27.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Fig. 1—Principal causes of strikes and lockouts

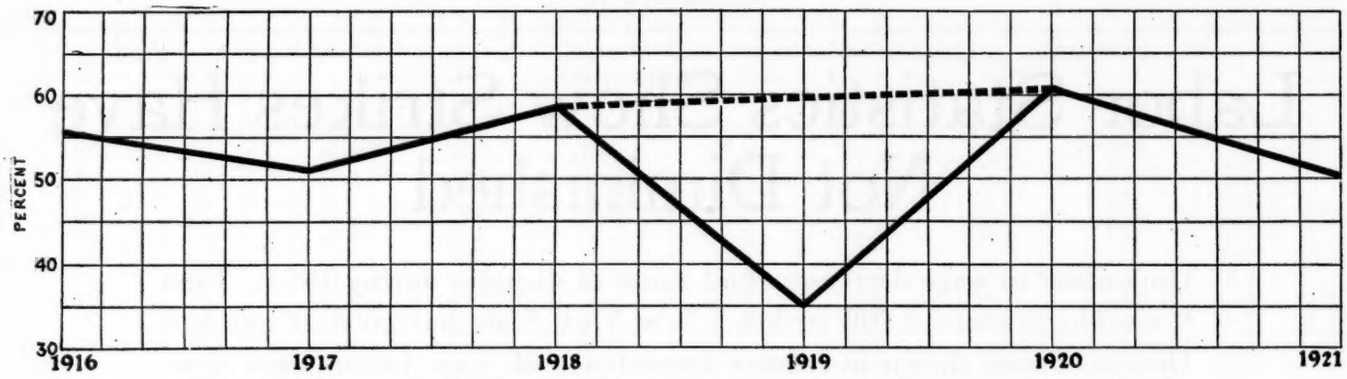


Fig. 2—Percentage of total number of strikes involving wages, in one form or another, as a cause

these lines. It brings home very forcibly the responsibility which rests upon those conducting industry to provide to every industrial worker an opportunity for the highest personal development of which the worker is capable. Not only is this necessary from a social point of view, but it is advantageous and profitable from the point of view of the individual industrial organization. The practical ideal of service—to those within and without the organization—is gradually being recognized in American industry as the steadiest and soundest road to increased business and permanent progress.

All this is a bit aside from the immediate matter of labor statistics, yet the "75 per cent" quoted above is probably the most significant "statistic" that has been estimated for some time.

It is essential, however, that a true estimate of value be placed upon all statistical data used in industry. The majority of strike statistics, for example, used in this article are indicative of the general sentiment of workers just about to the extent that such general sentiment is voiced by organized labor. Strikes are almost entirely the result of organized labor. Yet it must be recognized that just as much discontent and consequent reduction in production efficiency may occur in cases where labor is unorganized and strike records do not appear. The result in the latter case may be just as bad, but simply more difficult to record statistically.

This fact is not always sufficiently recognized by students of labor statistics and as a result erroneous conclusions are frequently drawn upon the basis of the data available. It is just as important in an analysis of this kind to understand clearly the limitations of the figures involved as to know the figures themselves.

Industrial depression has had little effect upon the number of strikes. The first three-quarters of 1921 show a total of 2200 strikes as against a total of 3109 for the entire year of 1920. Thus it appears that if the last quarters of 1921 produced as many strikes in proportion as did the three previous quarters the total for the year would be only slightly under that of 1920.

A review of the total number of strikes during the last six years shows a remarkable uniformity, the variation being less than 1000 in any case. The record follows:

Year	Strikes	Lockouts
1916	3,681	108
1917	4,324	126
1918	3,248	105
1919	3,444	125
1920	3,109	58
1921 (9 mo.)	2,200	56

There is one significant deduction, perhaps, that may be drawn from this uniformity. There is an indication that so long as present methods prevail on the part of employer and employed the struggle between the two is likely to be carried on with equal vigor regardless of the condition of industry or the surface causes that may be given for the outbreak in each case. For many years labor was underneath in the industrial struggle and some employers felt themselves secure in their power. The war brought to labor its first real opportunity to exercise power and the natural reaction from these previous years was for it to exercise that power to its fullest extent, unwisely in many instances.

Again the industrial scales have turned. Labor is plentiful, and the employer has the advantage, so far as dealing with his workers is concerned. If the uniformity of these strike figures shows anything at all, it is the certainty of continued future trouble if management seizes the opportunity which it now has to "get even" with workers for real or fancied wrongs during war and post-war days.

The handling of industrial relations during the next few months will have a very definite effect upon the rapidity with which any given company will be able to return to complete stability.

A prominent railroad executive stated recently that the willing and hearty co-operation of members of the railway brotherhoods would mean a saving in operating expenses of 4 to 5 per cent; that a certain proposed wage decrease for these brotherhood members would mean a saving of 1 per cent, and that consequently it would be very poor economy to make the proposed reduction if such action meant the loss of that willing and constructive co-operation.

Without debating the details of the figures involved in this statement, the words of this official, who had in mind only the management viewpoint, well illustrates the point made in preceding paragraphs. A careful study of personnel problems as related to the individual within the plant is possible at this time when production needs are not pressing. Experimentation is possible that would not be feasible when peak production is necessary. The uniform

RESULTS OF STRIKES AND LOCKOUTS, 1916-1921 (9 MO. OF 1921)

RESULT	STRIKES ENDING IN						LOCKOUTS ENDING IN					
	1916	1917	1918	1919	1920	(9 Mo.) 1921	1916	1917	1918	1919	1920	1921
In favor of employers	727	382	459	661	633	301	21	13	6	19	10	8
In favor of employees	733	614	612	565	360	285	16	17	15	16	7	5
Compromised	766	699	674	785	429	176	11	21	17	11	6	3
Employees returned pending arbitration	70	131	199	45	59	49	3	6	5	3	2	..
Not reported	99	190	190	36	197	105	2	1	21	21	2	4
Total	2,395	2,016	2,134	2,092	1,678	916	53	58	64	70	27	20

Fig. 3—Results of strikes and lockouts

OCCUPATIONS IN WHICH THE LARGEST NUMBER OF STRIKES AND LOCKOUTS OCCURRED IN EACH YEAR, 1916 TO 1920

INDUSTRY	STRIKES						LOCKOUTS						Grand Total
	1916	1917	1918	1919	1920	(9 Mo.) 1921	1916	1917	1918	1919	1920	(9 Mo.) 1921	
Building trades	376	447	418	445	498	515	18	21	16	19	8	8	2700
Clothing	222	483	418	309	260	172	5	12	18	7	16	3	1864
Iron and steel	72	56	72	68	24	19	..	..	2	8	1	..	320
Leather	34	19	15	27	29	16	..	..	1	..	3	..	140
Lumber	44	295	75	44	37	26	..	4	1	2	..	1	517
Metal trades	547	513	441	551	398	202	..	2	..	29	9	6	2671
Mining	402	418	185	174	178	74	14	31	23	2	2	1	1377
Paper manufacturing	51	39	35	44	39	34	3	2	5	3	..	..	537
Printing and publishing	25	40	40	64	76	323	2	1	..	6	2	9	555
Shipbuilding	27	103	136	108	44	19	4	3	4	1	..	..	430
Meat Cutting	70	38	39	71	42	17	..	..	3	2	..	..	281
Stonework	59	26	14	13	29	20	2	..	..	..	..	..	161
Textile	258	242	209	263	208	102	3	5	3	9	2	1	1297
Transportation	224	342	226	185	238	49	4	1	1	1	..	2	1324

Fig. 4—Occupations in which largest number of strikes occurred

strike figures show the results of obsolete methods.

The most striking thing in the table of strike causes is the natural change in the major causes of strikes. As usual the chief cause is wages, but in previous years—from 1916 at least—the strikes have been for increased wages; 1921 shows a reversal. The workers struck nearly 900 times during the first 9 months of 1921 because their wages had been decreased.

This change follows definitely the trend of the industrial situation, the workers striving to maintain what they have obtained in past years of fighting and the employers finding it necessary to reduce operating expenses. For the rest, strike causes showed little radical change, except in the case of decreased hours. Twelve per cent of the strikes in 1921 were fought over demands for less working hours, while 3 per cent was the highest reached in previous years, 1920 showing only about 2 per cent. The trend in lockout causes follows this same course, a greater percentage of lockouts having been instituted because the workers demanded decreased hours than ever before.

An interesting trend is brought out by the curve shown in Fig. 2, which was plotted on the basis of figures compiled from the table of strike causes. This curve shows the percentage of total strikes during the last six years in which wages figure either as a major or minor cause.

Wages As a Strike Cause

It appears that over half of the strikes during this period were fought over matters involving questions of wage, and that in only one year, 1919, has there been any marked deviation from a uniform proportion. In analyzing this curve it should be remembered that the announced cause of strikes has little relation to the fundamental causes. The announced cause is simply the point over which the break in relations finally came or the battleground chosen for a particular fight.

The 1919 deviation in this curve, however, marks the period at which labor attained its highest power in American industry. A possible interpretation of the drop in the curve may, consequently, be that at this time labor found itself in a position to actively fight for some of those other things which it had always desired but had never been able to take a stand on, because of the necessity for fighting for the primary life-giving factor, wages. The return of the curve to its apparently normal percentage indicates that workers are again under the necessity of fighting for the necessities.

Employers have won more strikes in 1921 than did the workers, although if the number of "compromised" strikes were added to the employees' total the employers would be behind for the year. There is some justification for such addition, since it is obvious that every time a strike is compromised the employer gives up something that he held before the strike occurred. Thus, the workers may not count the strike as won unless they obtain the results which they stated as their desire when starting the strike, yet if a compromise is made they have gained something. This has nothing to do with the rights or wrongs of the various matters under dispute, of course, but serves to illuminate to some extent the table shown in Fig. 3. During the past six years the number of strikes ending in favor of employers has been just about equal to the number ending in favor of employees.

Building Trades Furnish Most Trouble

The building trades furnished the most trouble for employers again in 1921 as they did in 1920, their record last year putting them ahead of the metal workers as strikers for the last six years.

The most startling jump in number of strikes during 1921 was made in the printing and publishing trades. Three hundred and twenty-three strikes and 9 lockouts occurred in this trade during the first 9 months of last year, while the 1920 total of 70 was the highest that had ever before occurred. The metal trades were involved in less strikes last year than during any similar period. Their total for the first three-quarters was only 202, which is small, comparatively speaking. The five trades involved in the greatest number of strikes last year were as follows:

Building trades	515
Printing and publishing	323
Metal trades	202
Clothing	172
Textile	102

The six-year total of strikes by trades looks somewhat different, however, as the miners played a large part in strikes during previous years, but engineered only 74 in 1921. The six-year totals are:

Building trades	2700
Metal trades	2671
Clothing	1864
Mining	1377
Transportation	1324
Textile	1297

It is impossible to determine the trade having the least number of strikes, since only those having at least a certain number are listed.

Allied Industry Strikes

The chart shown in Fig. 5 is based on six-year total strike figures in the industries shown. The six industries involved are all more or less allied to the automotive field, some more directly than others. The automotive executive, however, is interested in the general trend of industrial relations in allied industries, since he has found by experience that unstable labor conditions in an allied industry may affect his factory operations very materially.

The chart simply depicts graphically what is shown elsewhere in figures. It shows the leather industry to

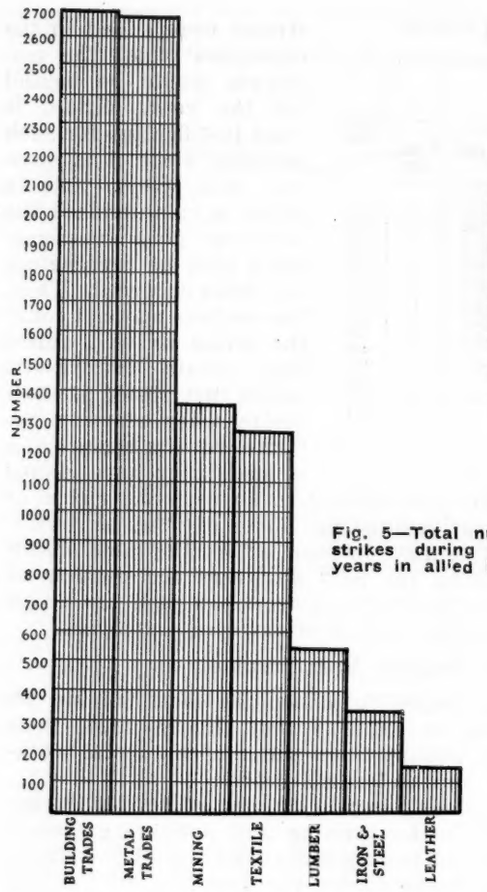


Fig. 5—Total number of strikes during last six years in allied industries

be in the best position of the entire group, having been involved in only 140 strikes in six years.

New York maintains its unenviable position as the State in which most strikes have occurred. Having held this honor without interruption for six years, the Empire State naturally has an excellent lead in the six-year total. There is little to be said concerning the statistics in Fig. 6, except that the 1921 results follow in almost exactly with the trends established during previous years.

New York, Pennsylvania and Massachusetts had the greatest number of strikes last year among this group of industrial high-strike states. The total for six years places the five leaders as follows:

New York	3224
Pennsylvania	2002
Massachusetts	1982
Illinois	1259
Ohio	1249

NUMBER OF STRIKES BEGINNING IN EACH YEAR IN SOME OF THE CHIEF INDUSTRIAL STATES, 1916, 1917, 1918, 1919, 1920 AND FIRST THREE QUARTERS OF 1921

	STRIKES						
	1916	1917	1918	1919	1920	1921	Total
New York	577	696	668	515	459	309	3224
Pennsylvania	566	481	304	265	202	184	2002
Massachusetts	374	342	341	376	366	183	1982
New Jersey	411	219	138	171	120	115	1174
Ohio	276	261	188	214	170	136	1249
Illinois	149	276	237	252	202	143	1259
Connecticut	325	178	90	120	124	59	898
Washington	57	290	126	78	54	57	662
Missouri	90	117	100	63	53	51	409
Indiana	70	65	68	91	64	32	455
Michigan	66	62	59	79	44	64	374

Fig. 6—Number of strikes in some of chief industrial states

DURATION OF STRIKES, 1916, 1917, 1918, 1919, 1920 AND 9 MONTHS OF 1921

	STRIKES ENDING IN						LOCKOUTS ENDING IN					
	1916	1917	1918	1919	1920	1921	1916	1917	1918	1919	1920	1921
1 day or less	179	282	229	105	88	37	..	2	..	..	..	..
2 days	183	111	170	69	63	20	2	2	1	1	..	..
3 days	146	102	127	80	53	29	1	3	..	..	1	..
4 days	124	61	111	78	50	21	1	1	..	..	..	..
5 to 7 days	330	213	251	185	140	56	6	3	3	3	1	2
8 to 14 days	408	215	268	287	213	75	10	4	4	4	3	2
15 to 21 days	224	118	151	199	104	80	7	3	9	9	2	1
22 to 29 days	99	54	69	113	88	40	2	4	3	3	2	1
30 to 90 days	266	185	225	517	298	184	6	8	29	29	7	7
Over 90 days	104	60	49	161	145	139	18	4	10	10	4	3
Not reported	332	615	484	298	436	136	..	24	5	11	7	2
Total	2395	2016	2134	2092	1678	817	53	58	64	70	27	18

Fig. 7—Duration of strikes

Again in 1921 the tendency toward a reduced length of strikes is apparent. As in previous years, the greatest number last from 1 to 3 months, but last year the number lasting this long was only 23 per cent of the total, as against 25 per cent in 1920 and 29 per cent in 1919. Thus it appears that industrial questions are having a tendency to be brought to a more rapid conclusion than in the past after a strike has started. Whether or not this tendency toward a rapid settlement has any relation to the satisfactory nature of the settlement cannot be determined from any available statistics.

Works Councils

Without presenting any statistical data it can be stated that very probably there has been a decrease in the number of works councils in the United States during 1921. This was expected by many as the natural result of industrial depression. It was natural, however, not so much as a result of industrial depression as of the spirit and purpose which was behind the original installation of such councils in some cases.

In certain instances "industrial democracy" was instituted without any special belief by the management in its essential soundness. Some managements installed it without understanding it or the almost certain lines of its development. The spirit behind some of these installations was defensive or offensive rather than co-operative.

In such cases the plan did not work out to the satisfaction of the management—and usually failed to satisfy the workers. Many such industrial councils have gone out of existence during the last two years.

Many others have survived, however, and are operating as helpful, constructive forces in aiding the management to weather the storm of industrial depression. The automotive industry has several examples of this successful type of council. The success has been achieved because the councils were originally installed, not with any philanthropic purpose, but with the purpose of developing the business and the factory to its highest efficiency through the utilization of the individual intelligence and co-operation of every man in the plant.

It is perfectly possible in many cases, of course, to obtain equally good results without any organized group of employees. It is worth while to point out again that the spirit behind the handling of industrial relations is the essential thing, while the mechanical means used to translate that spirit into action is a minor consideration in any case.

The truth of this principle has been well illustrated by the success or failure of the various works councils installed during war and post-war years. The principle itself has come to form the basis of operation for practically every plant in which harmonious relations exist between employers and employees.

Road Construction Lags Far Behind Car Registration

In 1914 there were 7 motor vehicles to a mile of surfaced road. To-day it is estimated that the proportion is 27 to 1. While accurate mileage figures for the last two years are not available, the following curve shows definite need for highway growth. Bureau of Roads Survey in progress.

WHILE accurate statistics are not yet available, it is probable that some 25,000 miles of surfaced road were added to the total for the United States during 1921. On Dec. 31, 1921, there were 15,834 miles of Federal Aid Road projects under way, and about 70 per cent of this total had been completed. Only about half of the new road construction during 1921 consisted of Federal Aid projects, however, so that the estimated total of 25,000 miles of new roads for the year is probably not far wrong.

More Federal aid money is being expended in Texas than in any other State so far as regards projects under construction at the end of 1921. New roads costing nearly $22,000,000 are under way in that State.

It is estimated by certain authorities that a billion dollars will be spent on highways during 1922. This sum would include carrying and amortization charges on outstanding bonds, administration expenses, traffic regulation, highway maintenance and highway construction. This expenditure has become necessary to efficient functioning of modern industrial transportation and is based upon sound economic foundation.

Vehicle Registration vs. Road Growth

It is interesting to compare the relative rate of growth of motor vehicle registration and the total mileage of improved roads in the United States. The accompanying chart brings out this relation clearly. The curves are constructed on a semi-logarithmic scale, thus permitting the lines to show the proportionate growth of these two factors.

It will be noted that the curve showing the rate of growth of motor vehicle registrations increases more rapidly and is more uniform than is the curved based upon surfaced road mileage. This is natural because the growth of the motor vehicle has steadily increased, whereas the surfaced road mileage has been subject to many hindrances which did not allow its growth to proceed along the lines it would naturally take on an economic basis.

Automobile registration was increased because of the individual needs and the individual action of supplying those individual needs. Road mileage increase has been dependent upon the group action of many individuals and has thus been slower and less steady than the growth in the number of vehicles in use.

Even though the curves are plotted only from 1914, the miles of paved road, it must be remembered, were entirely inadequate for the economic needs of transportation at that time. In 1914 there were 7 motor vehicles for every mile of paved road. To-day there are 27 motor vehicles for every mile of paved road.

Thus it becomes apparent that surfaced road mileage must increase at a considerably more rapid rate than motor vehicle registrations if the economic necessity for good roads is to be met.

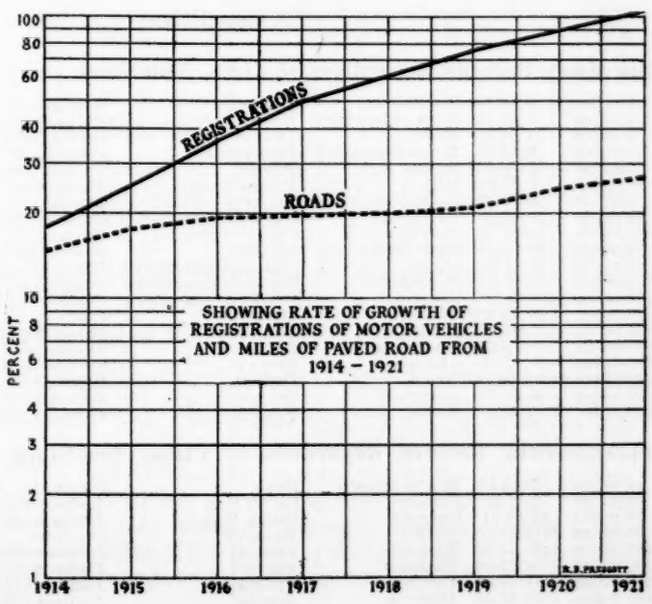
The figures used in constructing the road mileage curve are taken from the records of the U. S. Bureau of Roads for the years 1914-1918 inclusive. The figures are listed in reports of the Bureau as "Total of all surfaced roads." The 1919 figures are taken from the Bureau of Roads figures so far as regards State highway mileage. To this total, 20 per cent was added to take in county and other road construction.

Survey in Progress

For 1920 and 1921 accurate figures are not available anywhere at the present time. For certain internal departmental reasons, the Government did not collect this data for these years. A survey is under way at the present time, however, which will bring the figures entirely up to date. The estimates of 350,000 for 1920 and $375,000 for 1921, which are used in the chart, have been made on the basis of the best data available at the present time.

The exact accuracy of this 1921 figure, however, is not necessary to the purpose of the chart, as the relative growth of motor vehicle registrations and surfaced road mileage is well illustrated in any case.

There is a great need for highway transport education throughout the country, and the movements now devoted to this work should have the hearty support of the automotive industry. A thorough understanding of the economics of highway transport is essential to the maximum growth of car and truck use.



Automotive Vehicle

AMERICAN AUTOMOBILE RECORDS

Non-Competitive

Speedway Records, Class "B," Stock Chassis

300 to 450 Cubic Inches Piston Displacement

5 Miles	3:15.88	Mulford	Paige	Uniontown, Pa.	May 20, 1921
10 Miles	6:31.48	Mulford	Paige	Uniontown, Pa.	May 20, 1921
15 Miles	9:45.96	Mulford	Paige	Uniontown, Pa.	May 20, 1921
20 Miles	13:01.48	Mulford	Paige	Uniontown, Pa.	May 20, 1921
25 Miles	16:37.94	Mulford	Paige	Uniontown, Pa.	May 20, 1921
50 Miles	33:16.43	Mulford	Paige	Uniontown, Pa.	May 20, 1921
75 Miles	50:00.80	Mulford	Paige	Uniontown, Pa.	May 20, 1921
100 Miles	1:06:53.26	Mulford	Paige	Uniontown, Pa.	May 20, 1921

Speedway Records Regardless of Class, Non-Stock

¼ mile.....	0:05.91	Rader	Packard Special	Sheepshead Bay	July 28, 1917
½ mile.....	0:13.94	Rader	Packard Special	Sheepshead Bay	July 28, 1917
1 kilo.....	0:17.35	Rader	Packard Special	Sheepshead Bay	July 28, 1917
1 mile.....	0:28.76	Rader	Packard Special	Sheepshead Bay	July 27, 1919
2 miles.....	0:57.81	Rader	Packard Special	Sheepshead Bay	July 27, 1917
3 miles.....	1:26.61	Rader	Packard Special	Sheepshead Bay	July 27, 1917
4 miles.....	1:55.74	Rader	Packard Special	Sheepshead Bay	July 27, 1917
5 miles.....	2:24.65	Rader	Packard Special	Sheepshead Bay	July 27, 1917
10 miles.....	4:50.88	Rader	Packard Special	Sheepshead Bay	July 27, 1917

Straightaway Records, Class "B," Stock Chassis (Piston Displacement)

300 to 450 Cubic Inches

Kilometer	21.56	L. F. Goodspeed	Roamer	Daytona	April 22, 1921
1 mile	34.25	L. F. Goodspeed	Roamer	Daytona	April 22, 1921
2 miles	1:08.86	L. F. Goodspeed	Roamer	Daytona	April 22, 1921
3 miles	1:43.69	L. F. Goodspeed	Roamer	Daytona	April 22, 1921
4 miles	2:18.08	L. F. Goodspeed	Roamer	Daytona	April 22, 1921
5 miles	2:53.48	L. F. Goodspeed	Roamer	Daytona	April 22, 1921

Straightaway Records Regardless of Class, Non-Stock

½ mile	0:11.57	Milton	Duesenberg	Daytona, Apr. 27, 1920
1 kilo	0:14.40	Milton	Duesenberg	Daytona, Apr. 27, 1920
1 mile	0:23.07	Milton	Duesenberg	Daytona, Apr. 27, 1920
2 miles	0:46.24	Milton	Duesenberg	Daytona, Apr. 27, 1920
3 miles	1:12.18	Milton	Duesenberg	Daytona, Apr. 25, 1920
4 miles	1:36.14	Miltcn	Duesenberg	Daytona, Apr. 25, 1920
5 miles	2:00.04	Milton	Duesenberg	Daytona, Apr. 25, 1920
10 miles	4:09.31	De Palma	Packard Special	Daytona, Feb. 16, 1919
15 miles	6:48.75	De Palma	Packard Special	Daytona, Feb. 17, 1919
20 miles	8:54.20	De Palma	Packard Special	Daytona, Feb. 17, 1920

(Standing Start)

1 mile	0:38.83	De Palma	Packard Special	Daytona, Feb. 17, 1920

(Officially recognized by the American Automobile Association as being the record for this country in each class.)

Competitive

Speedway Records Regardless of Class, Non-Stock

1 mile	0:40.23	De Palma	Mercedes	Des Moines, Ia.	June 24, 1916
2 miles	1:09.57	Louis Chevrolet	Frontenac	Chicago, Ill.	Sept. 3, 1917
3 miles	1:54.81	Resta	Peugot	Des Moines, Ia.	June 24, 1916
4 miles	2:14.22	Louis Chevrolet	Frontenac	Chicago, Ill.	Sept. 3, 1917
5 miles	2:56.35	Resta	Peugot	Omaha, Neb.	July, 15, 1916
10 miles	5:20.20	Milton	Duesenberg	Sheepshead Bay, N. Y.	June 14, 1919
15 miles	8:18.90	De Palma	Packard Special	Chicago, Ill.	Sept. 3, 1917
20 miles	10:50.20	De Palma	Packard Special	Chicago, Ill.	July 28, 1918
25 miles	14:12.72	De Palma	Packard Special	Chicago, Ill.	Sept. 3, 1917
50 miles	26:23.40	De Palma	Packard	Sheepshead Bay, N. Y.	June 14, 1919
75 miles	40:31.00	Hearne	Disteel-Duesenberg	Cotati, Cal.	Aug. 14, 1921
100 miles	54:05.80	Hearne	Disteel-Duesenberg	Cotati, Cal.	Aug. 14, 1921
150 miles	1:21:19.20	Hearne	Disteel-Duesenberg	Cotati, Cal.	Aug. 14, 1921
200 miles	1:55:11.05	Mulford	Hudson	Chicago, Ill.	June 16, 1917
250 miles	2:23:04.03	Aitken	Peugot	Sheepshead Bay, N. Y.	Sept. 30, 1916
300 miles	2:55:32.23	Anderson	Stutz	Sheepshead Bay, N. Y.	Oct. 9, 1915
350 miles	3:24:42.99	Anderson	Stutz	Sheepshead Bay, N. Y.	Oct. 9, 1915
400 miles	4:04:48.98	Resta	Peugot	Chicago, Ill.	June 26, 1915
450 miles	4:35:05.78	Resta	Peugot	Chicago, Ill.	June 26, 1915
500 miles	5:07:26.00	Resta	Peugot	Chicago, Ill.	June 26, 1915

Straightaway Records Regardless of Class, Non-Stock

10 miles	5:14.40	Bruce-Brown	Benz	Daytona	Mar. 24, 1909
20 miles	13:11.92	Burman	Buick Bug	Jacksonville	Mar. 30, 1911
50 miles	35:52.31	Burman	Buick Bug	Jacksonville	Mar. 28, 1911
100 miles	1:12:45.20	Bernin	Renault	Daytona	Mar. 6, 1908
150 miles	1:55:18.00	Disbrow	Special	Jacksonville	Mar. 31, 1911
200 miles	2:34:12.00	Disbrow	Special	Jacksonville	Mar. 31, 1911
250 miles	3:14:55.00	Disbrow	Special	Jacksonville	Mar. 31, 1911
300 miles	3:53:33.50	Disbrow	Special	Jacksonville	Mar. 31, 1911

SPEEDWAY RECORDS, 1921

One-mile, Otto Walker, Harley-Davidson, Fresno, Cal., Feb. 22, 1921. Time, 33 2/5 seconds.

Two-mile, Albert Burns, Indian, Fresno, Cal., Feb. 22, 1921. Time, 1:09 4/5.

Five-mile, Jim Davis, Harley-Davidson, Beverly, Cal., Apl. 24, 1921. Time, 2:51 4/5.

Ten-mile, Otto Walker, Harley-Davidson, Fresno, Cal., Feb. 22, 1921. Time, 5:45 4/5.

Twenty-five mile, Otto Walker, Harley-Davidson, Beverly, Cal., April 24, 1921. Time, 14:21 4/5.

Fifty-mile, Otto Walker, Harley-Davidson, Fresno, Cal., Feb. 22, 1921. Time, 29:34 3/5.

1921 MOTORCYCLE RACING RECORDS

National Championships

(61-Inch)

One-mile, Fred Ludlow, Harley-Davidson, Syracuse, N. Y. Time, 44.05 sec.

Five-mile, Fred Ludlow, Harley-Davidson, Syracuse, N. Y. Time, 3:45.54.

Ten-mile, Fred Ludlow, Harley-Davidson, Syracuse, N. Y. Time, 7:38.80.

Twenty-five mile, Fred Ludlow, Harley-Davidson, Syracuse, N. Y. Time, 19:17.60.

Fifty-mile, Fred Ludlow, Harley-Davidson, Syracuse, N. Y. Time, 38:52.13.

One Hundred mile, Ralph Hepburn, Harley-Davidson, Dodge City, Kan. Time, 1:07.52 2/5.

Two Hundred mile, Ralph Hepburn, Dodge City, Kan. Time, 2:17.54.

Three Hundred mile, Ralph Hepburn, Harley-Davidson, Dodge City, Kan. Time, 3:30.03.

Races at Syracuse held Sept. 19, 1921.
Races at Dodge City held July 4, 1921.

M. & A. T. A. RECORDS

Regardless of Course or National Championship Events

(61 cu. in. Solo)

One-mile, Otto Walker, Harley-Davidson, Fresno, Cal., Feb. 22, 1921. Time, 33 2/5 seconds.

Two-mile, Albert Burns, Indian, Fresno, Cal., Feb. 22, 1921. Time, 1:09 4/5.

Five-mile, Jim Davis, Harley-Davidson, Beverley, Cal., April 24, 1921. Time, 2:51 4/5.

Ten-mile, Otto Walker, Harley-Davidson, Fresno, Cal., Feb. 22, 1921. Time, 5:45 4/5.

Twenty-five mile, Otto Walker, Harley-Davidson, Beverly, Cal., April 24, 1921. Time, 14:21 4/5.

Fifty-mile, Otto Walker, Harley-Davidson, Fresno, Cal., Feb. 22, 1921. Time, 29:34 3/5.

One Hundred mile, Ralph Hepburn, Harley-Davidson, Dodge City, Kan., July 4, 1921. Time 1 hr. 7 min. 52 2/5 sec.

Two Hundred mile, Ralph Hepburn, Harley-Davidson, Dodge City, Kan., July 4, 1921. Time, 2 hr. 17 min. 54 sec.

Three Hundred mile, Ralph Hepburn, Harley-Davidson, Dodge City, Kan., July 4, 1921. Time, 3 hr. 30 min. 3 sec.

(61 cu. in. Sidecar)

One-mile, Floyd Dreyer, Indian, Toledo, Ohio, Aug. 14, 1921. Time, 51 3/5 sec.

Two-mile, Floyd Dreyer, Indian, To-

Speed Records

World's Racing Records at Brooklands

(Officially Recognized by the International Federation of Automobile Clubs.)

Distance or Time		Car	Piston Displacement (cu. in.)	Weight, lbs.	Time or Distance	Speed (m.p.h.)	Date
½ mile	s.s.	4-cyl. Benz	1311	3610	Normal 25.31s. / Reverse 25.22s.	71.25	22- 1-14
½ mile	f.s.	4-cyl. Benz	1311	3610	14.076s.	127.877	8-11-09
1 kilometer	s.s.	4-cyl. Benz	1311	3610	Normal 29.62s. / Reverse 31.57s.	73.57	22-12-13
1 kilometer	f.s.	4-cyl. Benz	1311	3610	17.761s.	125.947	8-11-09
1 mile	s.s.	4-cyl. Benz	1311	3610	Normal 41.26s. / Reverse 41.16s.	87.34	22- 1-14
1 mile	f.s.	4-cyl. Benz	1311	3610	Normal 28.09s. / Reverse 29.93s.	124.10	24- 6-14
2 miles	f.s.	4-cyl. Benz	1311	3610	58.99s.	122.05	14- 1-14
5 miles	f.s.	4-cyl. Benz	1311	3610	2m. 35.08s.	116.08	14- 1-14
10 miles	f.s.	4-cyl. Benz	1311	3610	5m. 19.78s.	112.57	22- 1-14
50 miles	s.s.	4-cyl. Talbot	290	2882	27m. 2.23s.	110.96	27-10-13
100 miles	s.s.	12-cyl. Sunbeam	552	3207	55m. 35.55s.	107.93	10-10-13
150 miles	s.s.	12-cyl. Sunbeam	552	3207	1h. 25m. 14.94s.	105.57	10-10-13
200 miles	s.s.	6-cyl. Sunbeam	276	2601	2h. 5m. 6.28s.	95.92	1-10-13
300 miles	s.s.	6-cyl. Sunbeam	276	2601	3h. 7m. 45.46s.	95.87	1-10-13
400 miles	s.s.	6-cyl. Sunbeam	276	2601	4h. 12m. 15.08s.	95.14	1-10-13
500 miles	s.s.	6-cyl. Sunbeam	276	2601	5h. 16m. 40.01s.	94.74	1-10-13
600 miles	s.s.	6-cyl. Sunbeam	276	2601	6h. 22m. 54.16s.	94.02	1-10-13
700 miles	s.s.	6-cyl. Sunbeam	276	2601	7h. 29m. 36.55s.	93.41	1-10-13
800 miles	s.s.	6-cyl. Sunbeam	276	2601	8h. 34m. 25.15s.	93.31	1-10-13
900 miles	s.s.	6-cyl. Sunbeam	276	2601	9h. 53m. 22.29s.	91.00	1-10-13
1000 miles	s.s.	6-cyl. Sunbeam	276	2601	11h. 6m. 38.87s.	90.00	1-10-13
1 hour	s.s.	12-cyl. Sunbeam	552	3207	107 M. 1672 Yds.	107.95	10-10-13
2 hours	s.s.	6-cyl. Sunbeam	276	2601	195 M. 189 Yds.	97.55	1-10-13
3 hours	s.s.	6-cyl. Sunbeam	276	2601	287 M. 856 Yds.	95.83	1-10-13
4 hours	s.s.	6-cyl. Sunbeam	276	2601	380 M. 628 Yds.	95.09	1-10-13
5 hours	s.s.	6-cyl. Sunbeam	276	2601	473 M. 464 Yds.	94.65	1-10-13
6 hours	s.s.	6-cyl. Sunbeam	276	2601	566 M. 589 Yds.	94.39	1-10-13
7 hours	s.s.	6-cyl. Sunbeam	276	2601	653 M. 147 Yds.	93.29	1-10-13
8 hours	s.s.	6-cyl. Sunbeam	276	2601	748 M. 247 Yds.	93.51	1-10-13
9 hours	s.s.	6-cyl. Sunbeam	276	2601	840 M. 1533 Yds.	93.43	1-10-13
10 hours	s.s.	6-cyl. Sunbeam	276	2601	910 M. 969 Yds.	91.06	1-10-13
11 hours	s.s.	6-cyl. Sunbeam	276	2601	989 M. 828 Yds.	89.95	1-10-13
12 hours	s.s.	6-cyl. Sunbeam	276	2601	1078 M. 460 Yds.	89.85	1-10-13
13 hours	s.s.	4-cyl. Argyll	159	2726	992 M. 483 Yds.	76.33	27- 5-13
14 hours	s.s.	4-cyl. Argyll	159	2726	1070 M. 57 Yds.	76.43	27- 5-13
15 hours	f.s.	6-cyl. Napier			1006 M. 1640 Yds.	67.13	29- 6-07
16 hours	f.s.	6-cyl. Napier			1068 M. 400 Yds.	66.76	29- 6-07
17 hours	f.s.	6-cyl. Napier			1139 M. 1100 Yds.	67.03	29- 6-07
18 hours	f.s.	6-cyl. Napier			1203 M. 830 Yds.	66.36	29- 6-07
19 hours	f.s.	6-cyl. Napier			1263 M. 1170 Yds.	66.51	29- 6-07
20 hours	f.s.	6-cyl. Napier			1327 M. 1190 Yds.	66.38	29- 6-07
21 hours	f.s.	6-cyl. Napier			1390 M. 1100 Yds.	66.22	29- 6-07
22 hours	f.s.	6-cyl. Napier			1458 M. 130 Yds.	66.27	29- 6-07
23 hours	f.s.	6-cyl. Napier			1519 M. 360 Yds.	66.05	29- 6-07
24 hours	f.s.	6-cyl. Napier			1581 M. 1310 Yds.	65.91	29- 6-07
Light Car Class, Over 67.1 cu. in. (1100 c.c.) and under 91.5 cu. in. (1500 c.c.)							
½ mile	f.s.	4-cyl. A.-C.	91	1145	17.12s.	105.14	3- 6-21
1 mile	f.s.	4-cyl. Lagonda	91	1269	41.41s.	86.91	5-10-21
50 miles	f.s.	4-cyl. A.-C.	91	1349	31m. 57.82s.	93.86	29-11-21
1 hour	f.s.	4-cyl. A.-C.	91	1349	94 M. 1227 Yds.	94.70	29-11-21
100 miles	f.s.	4-cyl. A.-C.	91	1349	1h. 3m. 18.50s.	94.77	29-11-21
3 hours	f.s.	4-cyl. Wolseley	76	1583	245 M. 1501 Yds.	81.95	24-11-21
6 hours	f.s.	4-cyl. Wolseley	76	1583	490 M. 393 Yds.	81.70	24-11-21
12 hours	f.s.	4-cyl. A.-C.	91	1547	736 M. 1684 Yds.	61.41	13-10-21
200 miles	s.s.	4-cyl. Talbot-Darracq	90	1547	2h. 15m. 6.08s.	88.82	22-10-21
500 miles	s.s.	4-cyl. Wolseley	76	1583	6h. 6m. 46.37.	81.79	24-11-21

M. & A. T. A. Records

(Continued)

ledo, Ohio, Aug. 14, 1921. Time, 1:42 3/5.

Five-mile, Floyd Dreyer, Indian, Toledo, Ohio, Aug. 14, 1921. Time, 4:20 2/5.

Ten-mile, Sam Riddle, Indian, Sheepshead Bay, Oct. 11, 1919. Time, 8:15 3/5.

Twenty-five mile, Teddy Carrol, Indian, Sheepshead Bay, Oct. 11, 1919. Time, 20:36 2/5.

SOLO

One-Mile Dirt Track Records

One-mile, Gene Walker, Indian, St. Louis, Mo., Nov. 8, 1921. Time 42.3 sec.

Two-mile, Gene Walker, Indian, St. Louis, Mo., Nov. 8, 1921. Time, 1:26 1/5.

Five-mile, Gene Walker. Indian, St. Louis, Mo., Nov. 8, 1921. Time, 3:38.

Ten-mile, Gene Walker, Indian, St. Louis, Mo., Nov. 8, 1921. Time, 7:23 3/5.

Twenty-five mile, Fred Ludlow, Harley-Davidson, Syracuse, N. Y., Sept. 19, 1921. Time, 19:17.6.

Fifty-mile, Fred Ludlow, Harley-Davidson, Syracuse, N. Y., Sept. 19, 1921. Time, 38:52.13.

SIDECAR

One-Mile Dirt Track Records

One-mile, Floyd Dreyer, Indian, Toledo, Ohio, Aug. 14, 1921. Time, 51 3/5 seconds.

Two-mile, Floyd Dreyer, Indian, Toledo, Ohio, Aug. 14, 1921. Time, 1:42 3/5.

Five-mile, Floyd Dreyer, Indian, Toledo, Ohio, Aug. 14, 1921. Time, 4:20 2/5.

Ten-mile, Floyd Dreyer, Indian, Toledo, Ohio, Aug. 14, 1921. Time, 8:39.

Twenty-five mile, Floyd Dreyer, Indian, Toledo, Ohio, Aug. 14, 1921. Time, 21:47.

SIDECAR

Half-Mile Dirt Track Records

One-mile, Lester Foote, Harley-Davidson, Greeley, Col., Sept. 16, 1920. Time, 1:13 3/5.

Two-mile, Jiggs Price, Harley-Davidson, Lima, Ohio, May 30, 1921. Time, 2:24 4/5.

Five-mile, Floyd Dreyer, Indian, Pittsburgh, Pa., Oct. 10, 1921. Time, 5:32.

Ten-mile, Floyd Dreyer, Indian, Pittsburgh, Pa., Oct. 10, 1921. Time, 11:11 1/5

Official World's Aviation Records

Airplane Duration Record

"Eddie" Stinson and Lloyd Bertaud in Larsen J.L.-6, all-metal monoplane, one 185 h.p. B. M. W. (Bavarian Motor Works) motor, over Roosevelt Field, Garden City, Long Island, N. Y., continuous flight, December 29th-30th, 1921—26 hrs., 19 min., 35 sec.

(This flight broke the former world's record held by Lucien Bossoutrout and Jean Bernard, who on June 1st, 1920, remained aloft 24 hrs., 19 min., 7 sec., in Farman Goliath, two Salmsons, 260 h.p. air-cooled motors, at Villesauvage-La Marmogne, France.)

Airplane Altitude Record

Lt. J. A. Macready, U. S. Army Air Service, in a Lepere biplane, 400 h.p. Liberty motor, with supercharger, over McCook Field, Dayton, O., September 28th, 1921—indicated alt., 40,800 ft.. 37,800 ft. true alt. above sea level.

(This flight broke the former world's record held by Major Rudolph W. Schroeder, U. S. A. S., who on February 27th, 1920, in same machine reached indicated alt. 38,180 ft. and corrected or true alt. above sea level, 33,000 ft.)

Airplane Speed Record (Over a closed course)

Bert Acosta in Curtiss-Navy Racer (biplane) Curtiss, 400 h.p. 12 cyl. motor, winner of Pulitzer Trophy Race, at Omaha, Neb., November 3rd, 1921—153.59 miles (14 turns) in 52 min., 9 sec.; average speed of 176.7 m.p.h.

(This flight broke the world's record for closed course made by Georges Kirsch, winner of Deutsche de la Meurthe Trophy Race at Etampes, France, October 1st, 1921—186 miles (3 turns) in 69 min., 55 sec.; average speed, 173 m.p.h.)

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE
Reg. U. S. Pat. Off.

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The 1922 Statistical Number

EVERY effort has been made to present in this number accurate and complete statistical data concerning all of the important phases of the automotive industry. The rapid growth which has taken place during the last decade and the wide field of usefulness developed by automotive products have made necessary some broad, comprehensive compilation of statistical information concerning the industry which will give an accurate picture of its past, its present status, and its probable future trend.

This is the aim of the Statistical Number of AUTOMOTIVE INDUSTRIES. Each year it is possible to go just a little further toward completeness. The degree to which our aim has been accomplished in 1922 must rest with the opinion of our readers.

We hope that no errors appear in the statistical data presented. Every care has been taken to prevent them. If any have crept in despite our vigilance, we want to know about them.

Further Automotive Taxation Unjust

FAIR play is the first essential of sound legislation and this essential is entirely lacking in the proposals of the House Ways and Means Committee for methods of raising money for the proposed Soldiers' Bonus. The only possible excuse for saddling the automobile industry with a greater tax burden is that it has always been a ready pack-horse for tax burdens and may be able to bear more.

The automobile industry is already paying to the United States Government some $150,000,000 in taxes every year, enough to support the legislative, judicial and executive branches of the Government, and numerous other administrative functions besides. The various States of the Union are yearly deriving an increased revenue from automobile fees, the total for 1921 having been $122,000,000. These latter fees are, of course, entirely justifiable since they are necessary for road maintenance and are properly chargeable to car and truck owners in most cases. But the purpose for which the present funds are being raised is no more the responsibility of automobile owners than of any other group in the country. The utter unfairness of the proposals is strikingly apparent when it is realized that out of $329,000,000 in taxes endorsed by the committee on Feb. 9, the automobile industry through the users of its product would be expected to pay $120,000,000 in gasoline and horsepower taxes.

It must be remembered in this connection that automobile owners will, of course, bear their proportionate share of the other taxes on amusements, tobacco, stock and bond transactions, etc. In other words, they are taxed as a special class and then as individual citizens.

A tax on gasoline or a tax on horsepower is a tax on transportation. If gasoline is to be taxed, coal used by the railroads and electric power used by the electric railways should also be taxed. The automobile to a large extent—and the truck in every case—is a utility transportation vehicle engaged in economically necessary and efficient transportation. There is no justice in the proposal that the automobile and the truck bear such a transportation tax alone.

Thus far we have considered only the unjust nature of the proposed tax without regard to the purpose for which it is proposed to raise it, although that consideration is, of course, behind the whole discussion. The question has too many angles to permit full discussion here, but it may be said in general that the proposal for a Soldiers' Bonus at this time has more support among those with a political than among those with a business or economic viewpoint.

Unit Costs and Industrial Unrest

STATISTICS concerning strikes and lockouts are not, of course, accurate measures of industrial unrest. Perhaps no definite units will ever be derived suitable for measuring the degree of efficiency with which our industrial organization if functioning as regards human relations. There is considerable danger, however, in accepting spurious standards of

measurement. The experience of a few cases, the events in a particular instance, the tendency to apply as a general rule the results of an individual experience—such standards are not sound measures.

There is some ground, however, for the belief that unit production cost constitutes something like a fair measure of the degree of industrial unrest in a given industry or in a given manufacturing plant. There is a definite relation between enthusiastic and interested co-operation on the part of individual workers and the final unit manufacturing cost of the product. It is obviously impossible to work out this relation in a mathematical formula, but a long series of observations under varying conditions indicate the definite presence of such a relation.

In studying the human factor of group organization, the acceptance of this relationship forms an excellent basis for procedure and experiment. The maximum efficiency can then be obtained only through a study of the individual potentialities of the worker and the development of opportunities in his work for the fullest utilization of his abilities along lines for which he is best fitted.

Pleasure Cars No More

WE still hear the American passenger car referred to occasionally as a "pleasure" car, but it has long since ceased to be properly classed in that category by all who realize its essentially utilitarian nature. Evidence of this fact can be had at every turn, but there is still a disposition on the part of legislators to regard automobiles in general as luxuries which should be burdened with taxation at every opportunity.

It is a well-known fact that the use of luxuries is greatly curtailed in times of general business depression such as we have passed through during the last year, hence if the automobile is in truth a luxury how is one to account for the fact that they were used more than ever in 1921? It is true, of course, that a small proportion of cars which can rightly be classed as luxuries were laid up all or most of last year, while many trucks which are normally busy all the time were idle because industry was operating far below capacity and many plants were entirely closed for a part of the year. In spite of this fact there were over one and a half million more cars and trucks registered in this country than ever before! The use of luxuries certainly does not increase in this fashion when times are hard.

Furthermore, there was more gasoline consumed in this country in 1921 than in any previous year. If proof that the automobile is a necessity is needed we submit that these facts should be sufficient to convince the most skeptical. About half the cars and trucks are used on the farm or in rural communities, and a very large percentage of those used in cities are employed wholly or largely for business purposes. Automotive transportation is a basic necessity. A tax upon it is just as much a tax upon transportation, as a tax on freight or passenger traffic by rail or steamship, and is justified only to the extent that taxes on other means of transportation are justified.

Possibilities of Wider Tractor Application

TRACTOR use originated in the grain belt, where immense acreages are often held by individuals or companies. The present type of tractor meets the requirements in that section very well. Plowing is the work calling for the greatest power, and the average tractor of to-day is specially designed for pulling plows. There is, of course, a great deal of other work on these grain belt farms, such as disking or harrowing, seeding and harvesting, as well as the different operations connected with haying. While the advantages of the tractor over the horse do not stand out as prominently in these operations as in plowing, still it can be readily adapted to them and does the work with a fair degree of efficiency. In such grain States as Kansas and Minnesota, the tractor has always been strong.

A very large acreage in the United States is devoted to what is generally known as row crops, which require cultivation during the growing period. These crops include corn, cotton, tobacco, potatoes and beans. In districts where these crops are grown, the principle of crop rotation is generally adhered to, and there is, in consequence, a greater diversity of operations. Of course, there is plowing to do on every farm, but it has been calculated that on the average farm in the corn belt, plowing constitutes only 20 per cent of all the work for which horses are used. Hence, it will be readily seen that a tractor specially designed for plowing and not suitable for cultivation does not particularly meet the requirements on corn belt farms, and can never be expected to completely motorize these farms. The same applies with practically equal force to farms devoted to several other kinds of row crops.

Some years ago quite a number of firms developed motor cultivators intended to supplement tractors on row crop farms. However, in view of the fact that the average farm in the corn belt consists of only about 150 acres and the average farm in the Eastern States of only about 100 acres, some men in the tractor industry have recently come to realize that for the great majority of row crop farmers separate machines for plowing and cultivating would represent altogether too great an investment. As with so much other farm machinery, the equipment would lie idle the greater part of the year so that the fixed charges for depreciation and interest on investment would loom very large in comparison with the items of operating cost.

It is therefore necessary, it seems, to combine the functions of plowing and cultivating in one machine, and as cultivating and other light draft jobs form the work on the majority of such farms, there is now a tendency to develop machines which are especially efficient in cultivating and while not ideal for plowing, will satisfactorily do the work. These tractors, of course, are not at all likely to replace the present type, which has a well-established field, but will open up a new field which has as yet hardly been touched by the tractor industry.

Tax Protests Flooding Washington

Class Legislation, Industry Declares

Proposed Levy Apparently Killed —Warning Issued, However, Against Over-Confidence

WASHINGTON, Feb. 15—A flood of protests which has inundated Washington for a week apparently has killed effectually the eight-point tax proposals offered by a sub-committee of the Ways and Means Committee of the House to provide the funds needed for a soldier bonus. These proposals included a 1-cent a gallon tax on gasoline and an impost of 25 cents per horsepower on motor vehicles.

Farm organizations were the first to roll up the tide of protests. Then the American Automobile Association swung into line and other automotive associations followed, together with many other business organizations.

Harding Favors Sales Tax

President Harding is unalterably opposed to this tax program and undoubtedly would veto any revenue-producing bonus bill which included them. It is understood he favors a sales tax as a substitute. The farmers are opposed to a sales tax, however, and the impression is growing that there may be no bonus legislation at this session.

Representatives of the industry warn against over-confidence, however, and declare the present is an opportune time to make clear, once and for all, that the industry does not propose to keep silent while it is being made the victim of class legislation.

Denied hearings by Congressman Fordney, representatives of the National Automobile Chamber of Commerce and the American Automobile Association turned to those who would suffer most from the imposition of these taxes.

Farmers Would Be Affected

According to T. C. Atkeson, Washington representative of the National Grange, more than 50 per cent of the proposed 25 cents per horsepower tax on motor vehicles and the one cent per gallon on gasoline would be borne by the farmers of the country, an addition which, in the face of the present low price for farm commodities would work untold harm, in his opinion.

This position is substantially that assumed by the American Farm Bureau Federation, whose tax expert, H. M. McKenzie, has appeared against each of the eight points of revenue proposed.

According to the officials of the A. A. A., the most serious aspect of the proposed new taxes is their effect upon the roadbuilding program of the country. The heavy tax burdens with which motor vehicle owners are now confronted has already brought about a very considerable resistance to further taxation for road purposes in many states. The imposition of further federal taxes upon the already heavy special discriminatory levies would be sufficient, in the opinion of leading highway authorities, to bring about serious diminution in appropriations for roadbuilding in the several states, with the net result that the highway program which is just now quickening into full vigor would be retarded and millions of dollars lost in the added maintenance cost which would be necessary as a result of neglect of the highways at this time.

(*Continued on page* 439)

INDUSTRY WOULD PAY ONE-THIRD OF BONUS

NEW YORK, Feb. 13—According to the plans tentatively approved by the tax section of the House Ways and Means Committee which suggests a levy of 25 cents per horsepower on motor vehicles, another $50,000,000 would be levied on car and truck users as part of the program to secure funds for the soldier's bonus.

An additional $70,000,000 would be collected in great part from passenger car and truck users by the proposal to tax gasoline 1 cent per gallon.

The remaining two-thirds of the proposed taxes, aggregating $329,000,000, would be levied on stock and bond transactions, theatre admissions, cigarettes and tobacco, real estate transactions and by an increased parcel post rate.

The N. A. C. C. in furnishing data to the committee showing the utilitarian feature of cars and trucks dwells on the fact that a very small proportion of the tax would accrue from their use in recreation, and the unfairness of placing one-third of the bonus cost on a group of the public engaged in essential transportation.

Chrysler Has Quit as Aide to Willys

Resigns All Offices — Fight with Bankers for Willys-Overland Control Begins

NEW YORK, Feb. 16 — Walter P. Chrysler, one of the outstanding figures in the industry, has resigned as executive vice-president and a director of the Willys-Overland Co. and all other Willys companies. No successor will be appointed, and he has made no announcement concerning his plans for the future.

The resignation of Chrysler came unexpectedly. It followed by a day his resignation as a director to make way for an Ohio resident. This step was voluntary and it was announced after the meeting at Toledo, at which four new directors were elected, that Chrysler would retain his position as executive vice-president.

Chrysler has three or four flattering offers under consideration, but it is understood he has not yet decided which to accept. In the meantime he has leased offices in this city.

After attending the directors' meeting in Toledo, Chrysler went immediately to Detroit. He is chairman of the board of the Maxwell Motor Corp. and is understood to have a considerable interest in that company, but his friends do not believe he will take over the active management.

So far as can be learned there is no basis for the report that he will become president of the General Motors Corp.

With the action taken at Toledo, John N. Willys dominates the board of directors of the Willys-Overland Co., and the fight between the bankers and the other interests for control has come out into the open.

Before the bankers' plan for a bond issue of $25,000,000 can be presented to the preferred stockholders, it must be approved by the board of directors. Lacking this approval this refinancing program will be held up. Even if it reached the preferred stockholders it would not be accepted by holders of 75 per cent of the preferred stock.

Representatives of the bank creditors are meeting to-day at the Chase National Bank to determine upon a course of action. While the assets of the Willys-Overland Co. are more than $100,000,000, the bank loans total only $16,556,000 at this time, and there is $4,000,000 in cash on hand.

See page 443 *for earlier story on reorganization of Willys-Overland board of directors.*

Durant to Build Car at Ford Price

Washington Will See Unveiling in March

Will Be Made in Quantities by Subsidiary Company—Official Statement Issued

NEW YORK Feb. 15—The following statement was issued to-day from the headquarters of Durant Motors, Inc.:

"W. C. Durant, president of Durant Motors, Inc., has accepted a contract to build in quantities a four-cylinder, five-passenger automobile to retail at $348. The car will be on exhibition at Washington, D. C., March 9 The name of the car and the company will be made known on that date."

Further details in regard to this sensational announcement were absolutely refused. It was stated positively that nothing more would be given out until the date fixed. Durant and his family started this week for Palm Beach to spend three weeks, and his associates here profess ignorance of the project.

It was asserted positively at the Durant offices, however, that there was no joker in the statement and that the announcement covered a bona-fide proposition of magnitude.

The price of the five-passenger Ford car without starter and demountable rims is $348. With the added equipment it is $443. The Durant car will be equipped with both starter and demountable rims.

Not to Be Built at Elizabeth

The new car, which will compete with the Ford and which, it is assumed, will be necessary to produce in quantities if it is to be profitable, has been developed by Durant engineers, but no information is obtainable as to where the experimental work has been done.

The manufacturing company undoubtedly will be a subsidiary of Durant Motors, Inc Whether or not a factory site has been selected is not known, but Durant's associates did not take seriously a suggestion that the new car might be built in the big new factory of the Willys Corp. at Elizabeth, N. J.

The reason for selecting Washington for the unveiling of the new car was left to the imagination.

Considerable significance may be attached to the fact that Edward Ver Linden, who is president of the Durant Motor Car Co. of Michigan and who formerly was president of the Olds Motor Works, has gone South "to build up his health" almost simultaneously with the departure of Durant for Florida, and that Ver Linden probably will visit Palm Beach.

It is understood, also, that Fred W. Warner, formerly head of the Oakland division of General Motors, who has been in charge of the sale of Durant stock in Michigan, will spend considerable time at the Durant plant at Lansing while Ver Linden is absent.

Court Orders Operations of Racine Tire Resumed

RACINE, WIS., Feb. 15—The Federal Court has directed H. O. Smith, receiver for the Racine Auto Tire Co., to resume factory operations immediately. The voluntary petition in bankruptcy filed last week by directors of the company was the result of a heavy loss suffered in the operations of 1920. This seriously hampered the company's working capital and made new financing necessary notwithstanding the fact that conditions were materially improved by the business done last year.

Like all tire manufacturing companies there was a heavy loss between the market and contract price on fabric. This aggregated slightly less than $400,000, and wiped out the profits of 1921 after plant depreciation had been absorbed and refunds paid on account of the decline in tire prices. There now is strong hope that reorganization of the company will permit continued production of the "Horseshoe" brand of tire.

One Building Will Hold British Automobile Show

LONDON Feb. 1 (*By Mail*)—An announcement is made by Sir Alfred Mays-Smith, president of the British Society of Motor Manufacturers, that negotiations are now practically completed whereby it will be possible to hold the London passenger car show this year in one building, thus obviating the dual show at Olympia and White City which has been so much objected to by exhibitors at the latter.

A large proportion of American cars have been staged at White City during the last two shows and, with other exhibitors in that section, have undoubtedly suffered in consequence of the tendency of the public to specialize upon the cars at Olympia.

EARL CONFERS ON REFINANCING

NEW YORK, Feb. 15—Clarence A. Earl and members of the creditors' committee which is working out the refinancing of Earl Motors, Inc., are in New York this week for conferences with Percy Johnston, president of the Chemical National Bank. It is understood that nothing has developed to interfere with the satisfactory working out of the financial program and that the additional money needed will be subscribed.

Ford Car, Tractor, Truck All for $1,000

Manufacturer Planning It, Army Officer Testifies at Muscle Shoals Hearing

WASHINGTON, Feb. 15—Henry Ford is attempting to lower his production costs so that he can sell farmers a Ford automobile, tractor and truck, all for $1,000, according to testimony given by General Beach, chief of the Corps of Engineers of the United States Army, who appeared before the House committee on military affairs, which is investigating the offer of Ford to take over the government property at Muscle Shoals. The present price of the three is $1,173.

Hopes to Go Down in History

"Mr. Ford has said that he hopes to be able to cut the production costs of his machine to such a price that farmers can buy an automobile, a tractor and a truck for $1,000," General Beach said. "I have every reason to believe that he aspires to go down in history as the man who did the most to develop the agricultural resources of his country and the agricultural possibilities of the world."

W. D. Mayo, chief engineer of the Ford company, testified that it is the intention of Ford to operate plant No. 1 at Muscle Shoals for the manufacture of automobiles and tractor parts from raw materials. Ford hopes to be able to reduce the costs of raw materials, Mayo said.

"That has been his dream for some years past," he declared.

This testimony was construed to imply that Ford would produce light metals, possibly aluminum, which would enter into the construction of his automobile, but Mayo did not commit himself definitely as to production plans. He confined his testimony wherever possible to the manufacture of fertilizers and the development of plans for Muscle Shoals plants and power stations.

Not to Sell Water Power

It was made clear by Mayo that Ford intends to use all the horsepower developed and will not sell power to private or public concerns, unless it becomes evident there will be a surplus.

Senator Norris of Nebraska said he would call Ford personally to appear before the Senate agricultural committee, of which he is chairman and which will begin hearings on the Muscle Shoals project tomorrow. It is expected Ford will accept the invitation.

Southern senators and representatives are very active in their efforts to obtain the approval of Congress for the Ford contract.

G. M. Aims to Make Flat Rate General

Gradually Extending Standardization of Practices—Business Outlook for Year Satisfactory

NEW YORK, Feb. 14—Flat rates for service throughout all its divisions is the ultimate aim of the General Motors Corp. Accomplishment of this end is being approached as rapidly as possible. While nothing revolutionary is proposed, it is the determination of the corporation to give the users of its products the best service possible. To this end standardization of practices is being extended gradually, and the importance of keeping the owners of motor vehicles satisfied is being emphasized in the sales organization, both wholesale and retail. This extends to the parts question and includes the carrying of adequate stocks. The ultimate result will be that every owner of a General Motors vehicle, no matter where he may be located, will find spare parts easily accessible and they will be installed at a flat rate.

The service question has been neglected in the past, it is felt, because all the energies of factory organizations were devoted to meeting the demand for cars. Factories now can easily turn out all the automobiles that can be sold and still give adequate consideration to the production of service parts. The sales organizations also have time to instruct dealers in some advanced business methods.

No Expansion Program Planned

General Motors regards the outlook for the coming year as satisfactory. Business thus far this year has been far in excess of the same period in 1921, and sales are expected to expand as the year progresses. An increase has been apparent in the past two weeks.

The corporation has no expansion program in mind, and all its operations will be on a conservative basis. The dissolution of the Scripps-Booth division is well under way and the manufacture of cars has been discontinued. No decision has been reached as to what disposition will be made of the factory, but it will be used in connection with some of the existing units.

Development work on the air-cooled line which the corporation will bring out is progressing satisfactorily, but not even an approximate date has been fixed for getting these models into production. The plans of the company concerning the new line are as nebulous as they have been for several months, and ample time will be given the engineering department to perfect the car before any attempt is made to put it on the market.

TEMPLAR HEARING POSTPONED

COLUMBUS, Feb. 14—The case of N. Clyburn against the Templar Motors Co. and its board of directors, praying for a receiver, which has been pending in the Franklin county courts, was again postponed when it came up for hearing. The new date fixed is Feb. 20. In the meantime Attorney F. S. Monnett, representing Clyburn, will take depositions on the merits of the case in order to aid the court in arriving at a decision.

Stockholders of the company in Columbus have received notices of the annual stockholders' meeting at Lakewood, Ohio, March 1.

Shaw's Plan to Purchase Allen Motors Cancelled

COLUMBUS, Feb. 14—Negotiations for the sale of the plant and tangible assets of the Allen Motor Co., which has been in the hands of George A. Archer and W. C. Willard as receivers for more than six months, to Frank P. Shaw of Chicago, have been declared off. Shaw made a bid of $570,000 for the plant and assets, excepting cash on hand and bills receivable, and this was accepted by Judge Sater in the federal court. Later it developed that he could not carry out the plan because of the difficulties of the Fort Dearborn banks.

H. C. Runyon, who has personal charge of the assets under the receivers, reports two offers for the plant. One of them provided for immediate liquidation, while the other looked toward the continuation of the plant as a going concern. Neither has been accepted so far, and creditors will likely be called together for the purpose of obtaining their views.

In the meantime the plant is giving service to Allen car owners in Columbus and Central Ohio.

British Dunlop Names Stockholders Committee

LONDON, Feb. 11 (*by cable*)—The situation of the Dunlop Rubber Co., Ltd., was reviewed critically by the stockholders at a long meeting with Chairman Szarvasy. An optimistic view was taken, but it was decided to appoint a stockholders' committee to investigate the situation.

It is stated the bankers of the Dunlop company have saved temporarily the position of the American Dunlop company by postponing for a year their claims for repayment. The bankers have suggested as a possible solution a combination with existing interests in America, and these prospects will be surveyed by Director Proctor of the Dunlop company, who has sailed for America for that purpose.

OWN PLANT FOR RELIANCE

LOS ANGELES, Feb. 13—The Pacific Reliance Motor Corp. has made arrangements to assemble the Reliance truck in a plant of its own in addition to building a ¾-ton truck for school and bus trade. Several of these light trucks already have been delivered. One is in service between Somerton and Yuma, Ariz. These activities will be in addition to the sale of Reliance trucks in the western territory.

Seager Suit Settled By Stewart-Warner

Settlement Made On $450,000 Basis—Gets Sparton System Patents

CHICAGO, Feb. 13—The Stewart-Warner Speedometer Corp. has settled out of court the suit brought against it by James D. Seager, Arthur L. Payton and Cornelia F. Thomas for infringement of patents on vacuum tank equipment. The settlement follows a decision by Judge Carpenter in Federal Court holding that the Seager patents are valid and have been infringed by the Stewart-Warner Corp. This patent litigation has been pending for years and came to trial last June.

The settlement was on the basis of approximately $450,000, the Stewart-Warner Corp. received an exclusive license to manufacture the vacuum feed devices covered by these patents.

In connection with the settlement, the Sparks Withington Co., manufacturer of the Sparton system, will retire from the manufacture of vacuum systems and surrender its patents to the Stewart-Warner Corp., according to a statement by the latter company.

Advantageous to Company

"The settlement is advantageous to the company because it clears up misunderstandings and also some other phases that are important," according to a statement by Vice-President Bucklin of the Stewart-Warner Corp.

In his decision, Judge Carpenter said that, while the Jay Webb invention on which the Stewart-Warner system is based, doubtless is an improvement over anything Seager or Harrington described, the essentials of the Seager combination are retained in it.

The Stewart vacuum gasoline system is used as standard equipment on more than 90 per cent of all passenger cars.

Cravens Named President of Climax Engineering Co.

CLINTON, IOWA, Feb. 13—George W. Cravens, formerly of Westfield, N. J., has been elected president of the Climax Engineering Co., and G. W. Dulany, Jr., president of the G. W. Dulany Trust of which the Climax Engineering Co. is a subsidiary, has been made chairman of the board. The other officers were re-elected. The company will proceed energetically with the production and sale of Climax heavy duty engines. It is in an enviable financial position, having no trade liabilities as of Dec. 31, 1921.

Cravens, the new president, has had a wide engineering and commercial experience. He was chief engineer for the Elkhart Carriage & Motor Car Co., general manager of the American Motors Corp. and general manager of the Universal Body Co. after a long service with the General Electric Co.

Harry Moock Quits as N. A. D. A. Manager

Goes with Hudson-Essex — Vane Succeeds Him—Hay Resigns Presidency

ST. LOUIS, Feb. 14—Harry G. Moock, who has been general manager of the National Automobile Dealers Association for three years, has resigned to become director of the newly organized merchandising department of the Hudson Motor Car Co. and Essex Motors. He will be succeeded by C. A. Vane, who has been general counsel of the association.

Moock's resignation was offered at a special meeting of the directors of the N. A. D. A. held here yesterday. The session was called primarily to elect a successor to Thomas J. Hay of Chicago, who resigned as president. He will be succeeded as head of the organization by W. J. Brace of the Hudson-Brace Motor Car Co. of Kansas City.

Other Work Calls Hay

Hay, who was elected at the annual meeting of the N. A. D. A. at Chicago on Jan. 31, is the Chandler and Cleveland distributor in that city. He explained that he was compelled to relinquish the position because his interest in the Chicago and Illinois associations took so much of his time that he would be unable to devote the necessary attention to the national organization.

The resignations of Hay and Moock were entirely unexpected by the rank and file of the organization which formally inaugurated a new policy at the annual meeting. Under this plan the superstructure would be based on 1000 distributors and dealers paying dues of $50 to $250 a year. This idea was devised to supplant the old $10 a year memberships scattered all over the country with a few $100 sustaining memberships.

In his new position with the Hudson and Essex companies, Moock's efforts will be centered on assisting distributors and dealers in solving their merchandising problem. As the result of his work for the past three years, it is probable there is no one in the country more intimately familiar with dealer problems.

Moock Former Salesman

Moock has been in the automobile business ten years, five of which were spent as a dealer automobile salesman and the remainder in association activity. He helped organize and became manager of the Rocky Mountain Automobile Trade Association, the first interstate automobile trade association in the United States. Prior to his entry in the automobile business, Moock was a bond and insurance salesman.

Moock resigned as secretary of the Rocky Mountain association to become assistant secretary of the N. A. D. A. of Nov. 1, 1918. During the early days of the association much of the secretarial work was done by President Fred Vesper who was assisted by Bart J. Ruddle, who retired as secretary of the Milwaukee association to come to St. Louis. With the election of Moock, Ruddle became Washington representative. Much of the credit for building up the membership in the association in the early days is due to E. E. Peake of Kansas City. Moock became general manager early in 1919.

Vane has been connected with the N. A. D. A. since March, 1919, when he gave up newspaper work to become Moock's assistant. His duties at that time included the compiling of information called for by members and publicity. His legal training later resulted in his appointment as general counsel.

MOOCK SAYS PIONEER WORK IS CONCLUDED

ST. LOUIS, Feb. 14—"I cannot adequately express the regret I feel at leaving the association," Harry G. Moock, manager of the N. A. D. A., stated in his resignation to the directors at a meeting yesterday. "However, I feel that the pioneering work of the N. A. D. A. is over and that plans have now been put on foot which will be so readily adaptable to profiting the quality dealer that the association's success is assured. The offer made to me by the Hudson-Essex companies was so attractive that in justice to my future and the future of my family I could not decline it.

"I want to thank all the dealers and trade association secretaries for the wonderful manner in which they have supported my work. It is a real heartache to sever the connection that has existed between us, and I want to assure them all that I will continue to keep an interest in their work and give them my personal assistance whenever and wherever possible."

Franklin Mails Checks for Quarterly Dividend

SYRACUSE, Feb. 13—The H. H. Franklin Manufacturing Co. of this city made a profit in 1921, according to President H. H. Franklin.

"The chief concern of manufacturers has been to safeguard their capital rather than to make a profit," Franklin said. "The liquidation of high priced materials on a falling market is a difficult undertaking, but it can be said that the industry is succeeding very well. The present trend in all markets is toward stability."

The company has sent out checks covering the regular quarterly dividend, to approximately 4,350 preferred shareholders. The dividend is approximately $89,000. When shareholders receive shares on which they are now making partial payments, the quarterly dividends will exceed $95,000.

Bock Bearing Forms Company in Britain

Becomes Associated with P. & W. MacClellan Co.—To Build Plant at Glasgow

TOLEDO, Feb. 13—Plans for active entrance into world trade have been announced by R. E. Clingan, vice-president of the Bock Bearings Co. In conjunction with British interests the Toledo corporation has organized the British Bock Bearings, Limited, and has arranged for the construction of a complete plant at Glasgow, Scotland.

The new British company will have all of Great Britain and her colonial possessions, including Australasia, as sales territory. The Americas, including Canada, will be supplied by the Toledo plant.

The British interests identified with the Bock Bearings Co. in the new venture are members of an old established concern doing business under the firm name of P. & W. MacClellan Co. and operating plants near London, at Glasgow and in India. It is capitalized at more than $10,000,000.

Field Already Organized

Clingan says the new field is already organized from a sales standpoint by the MacClellan interests. It will be six months before the Glasgow plant will be able to function, and during the period orders will be handled directly by the Toledo plant. All of the special machinery will also be manufactured in the Toledo plant.

An order for the General Omnibus Co. of London is now being put through the plant here.

The British interests have been investigating the proposition for more than a year and believe that the Bock antifriction bearing has tremendous sales possibilities throughout the Empire.

In India they believe there is a special field on the "freight wagons" used as a part of railroad equipment. These small cars have four wheels and are very much like the American trailers. Castor oil is used to lubricate the ordinary bearings, and in jungle sections the railroads have experienced difficulties due to the stealing of the oil by natives.

To Form Other Subsidiaries

They believe that through this peculiar annoyance and through their association with the International Railways Association in furnishing other railroad equipment they will be able to place Bock bearings on much of the freight and tram equipment overseas.

Other subsidiaries will be organized in countries on the continent to exploit the Block patent licenses within a few years.

Clingan said the Bock company here is noting an increase in orders. Production is gaining. Directors voted to pay up cumulative dividends on preferred stock which were passed last year, and the next regular dividend will be met.

Reach No Decision On Valve Standard

Tire, Rim and Wheel Associations Exchange Views—Matter Goes to Committee

CLEVELAND, Feb. 13—The Tire & Rim Association and the Automatic Wheel Association, both of which have their national offices in this city, joined in a meeting here for the purpose of agreeing on standard valve equipment for disc wheels.

The conference was arranged by the officers of both associations, the standard valve idea being evolved in the hope that something could be done that would enable the owner to inflate his tire with less trouble.

The engineers of both organizations presented arguments on the question, and samples of disc wheels, containing special equipment, were presented with explanations offered by the exhibitors.

Members of the two organizations met in the Hollenden Hotel in the morning with representatives present from many eastern and western states. Manufacturers from all districts of the country were asked to offer suggestions, and from these it is hoped to offer something later that will be acceptable to both organizations.

Report Coming Soon

The morning meeting ended without a definite plan being agreed upon. The members of both organizations directed that a committee be appointed to consider the subject and to report at an early date.

In the afternoon members of the wheel association met in Hotel Cleveland to review the discussion of the morning. At the conclusion of the afternoon session Secretary George L. Lavery while stating that no announcement would be made at the present time indicated the subject under consideration had not been settled, although all persons participating in the discussions were co-operating heartily.

The wheel association did take up the matter of freight rate differentials on truck and passenger car disc wheels. The concession granted by the railroads to truck wheels in the matter of freight rates has operated against the makers of disc wheels for passenger cars, it was stated. At this time, opportunities for business are more favorable in the passenger car business, according to speakers at the meeting, who argued that every step should be taken to help those manufacturers.

Plans were laid for bringing the matter to the attention of railroad executives and to push a campaign vigorously for an adjustment of rates.

NEW BOMBING PLANE COMPLETED

DETROIT, Feb. 10—The first of the three all-metal bombing planes being made at the Stout Engineering Laboratories of this city for the U. S. Navy has been completed and is about ready to be shipped to the experimental flying field. The ships are of similar specifications. They are internally trussed types of 60 ft. span, and the first is equipped with two Packard 360 hp. engines. These planes have a carrying capacity of 2 ton and the maximum flying speed, according to the builders, will be well over 100 miles per hour.

Rail Car Makes Trial Run on Baltimore & Ohio Road

PHILADELPHIA, Feb. 13—A demonstration run of a rail motor car designed for branch-line railroads and for short hauls that do not produce sufficient traffic to warrant a regular train, was made between Philadelphia and Wilmington, on the main line of the Baltimore & Ohio Railroad. The railroad has under consideration the use of some of the cars on its light passenger traffic roads.

The car, which was built by the J. G. Brill Co., Philadelphia, is equipped with motor and chassis supplied by the White Motor Co. The car is of wood and steel, and has a seating capacity for 35 passengers and standing room for a like number. It has a carrying capacity of 10,500 lbs. and weighs 16,000 lbs.

The run to Wilmington, with several scheduled stops, was made in 1 hour and 16 minutes, and the return trip, without a stop, in 1 hour and 3 minutes. The distance is 26 miles.

Roads Are Greatest Need in Mexico, Caley States

CLEVELAND, Feb. 14—Fred H. Caley, secretary of the Cleveland Automobile Club, has arrived in Mexico City, where he went at the invitation of the automobile dealers, and will remain until March 1, assisting the automotive department of the Chamber of Commerce in preparing for the automobile show which will be held there from April 16 to 23.

The Mexican Post of Feb. 8 devotes a column on its first page to recounting the impressions of Mexico City gained by Caley. He voices the belief that development of a system of highways is most important to the stabilizing of Mexico. He believes Mexican roads would require comparatively little improvement beyond grading and drainage.

UPHOLDS STATE TAX LAW

ST. PAUL, MINN., Feb. 13—Judge H. O. Hanmft has handed down a decision upholding the State automobile tax law, but declaring it contains "glaring inequalities and irregularities seriously affecting a large number of individuals" and that it was "difficult to hold the act constitutional." The act taxes automobiles according to the factory prices on all models. As a result some persons owning a 1921 model are paying a higher tax than owners of 1922 models of the same cars because prices have fallen.

Competition Likely in Dirigible Work

Two Rival Companies May Be Formed to Build Aircraft for Commerce

NEW YORK, Feb. 14—Important developments in connection with the construction of dirigible aircraft in the United States may be expected in the near future. Two rival companies may be formed for the construction of aircraft of this type as commercial ventures.

Representation in the United States for the Zeppelin interests has been taken over by Harry Vissering of Chicago, a railway equipment manufacturer. His first negotiations were conducted with the interests allied with the General Electric Co., which have made a careful preliminary survey of the possibilities for the use of dirigibles in this country. It is understood, however, that these negotiations have come to an impasse and that they have been taken up with other important factors in the industrial life of the country, including a large automobile manufacturer.

Dr. Schutte of the Schutte-Lanz Co., which builds dirigibles similar to the Zeppelins, arrived in New York this week, and it is understood he will consult with the General Electric interests.

The Zeppelins are building a reparations airship for the United States Government and want it sent across the Atlantic four or five times for a thorough test before its delivery. They also have arranged with Spanish and Argentinean capital for a dirigible service between Spain and Buenos Aires.

Bids have been asked by the Zeppelins from an American aircraft manufacturing company for the construction of its new type of metal airplane.

Paige Reports 8698 Cars Shipped in 1921

DETROIT, Feb. 14—A preliminary report for 1921 made to stockholders of the Paige-Detroit Motor Car Co. shows shipments of 8698 cars last year as compared with 16,090 in 1920. Sales aggregated $15,114,200 in value against $26,864,300 in 1920. Profits from operations were $804,800 as compared with $1,422,300. Dividend payments on the preferred were $680,000 and on the common $200,000 as compared with cash dividends of $680,000 on the preferred and common in 1920. The inventory was reduced in 1921 from $6,018,700 to $3,594,701.

Schedules for the first six months of 1922 call for the manufacture of 13,170 cars, of which 7090 will be Paiges and 6080 Jewetts. This would mean shipments in that period of 4072 more cars than in all of 1921.

Directors of the company all have been re-elected and no changes have been made in the officers.

Bans All Activities That May Fix Prices

Attorney General Daugherty Gives Views Informally on Trade Associations

WASHINGTON, Feb. 15—Informal expression of Attorney General Daugherty regarding trade association activities made public to-day by Secretary of Commerce Hoover warns against the fixing of a uniform cost as to any item of expense and against co-operative advertising where producers or dealers use uniform trade labels, designs and trademarks because "the inevitable result would be a uniformity of price."

Passing upon other points raised in the Hoover questions, the Attorney General declares he can now see nothing illegal in association work, "provided always that it is not used whatever as a scheme or a device to curtail production, or enhance prices, and does not have the effect of suppressing competition."

Stabilization Mentioned

Stressing the fact that the statement is only tentative, the Attorney General pointed out the fact that "It is impossible to determine in advance just what the effect of a plan when put into active operation may be." He made it clear that he would not let this interdepartmental statement interfere with the prosecutions of the Department of Justice whenever it is found that competition is suppressed or prices are materially enhanced.

Mr. Daugherty says that it would not be possible to prejudge the effect of a plan, particularly with reference to "trade associations, whose members are vitally interested in advancing or, as they term it, stabilizing prices, and who through the medium of the associations are brought into personal contact with each other."

The inquiries were addressed to Attorney General Daugherty by Secretary Hoover, as the letter says, "not with the idea of creating a new scheme for carrying on business, but solely for the purpose of ascertaining whether or not they (trade associations) could properly be utilized in furnishing information that would be helpful not only to the Department and to the commercial world, but to the public generally, always keeping in mind that whatever activities were carried on by such associations, they should of necessity be within the terms of existing law."

Hoover Would Publish Data

Secretary Hoover made known his views on the scope of trade association activities and the desirability of making public trade data through the daily and trade press when he said:

> There has been much information collected by legitimate trade associations in which the general public has no interest whatsoever, yet information of this class has always been freely offered to the daily and the trade press, as well as to any governmental agency that might desire the information as a matter of statistical record. On the other hand, certain statistical data are collected by trade organizations that would be of vast value to the public generally if published in practical, available form.
>
> Information lawfully secured regarding trade and economic conditions made public for the information of everyone can not be harmful. Information secured solely for the benefit of members and of a character that puts the membership, by reason of the information, in a position of advantage as compared with the public without such information can not be sanctioned by sound public policy.
>
> The act of securing the information and the use of it by the members of a particular organization may be perfectly lawful in itself, but it is my belief that good morals and a sense of fair dealing require the giving of the information secured in this collective manner to the public generally, to the end that all persons engaged in commercial transactions involving the information in question will be on an even footing.
>
> If information regarding production, capacity, and distribution by districts, with average prices for grades, brands, sizes, styles, or qualities sold in the respective districts for specified periods of time could be given to the public at the same time that such information is available to the members of an association, in my judgment, great public good would result. With this information available, everyone dealing in the products of a given industry, whether buyer or seller, would have the same information regarding conditions and, in dealing with one another, would have knowledge of the same facts upon which to form their judgments as to the proper course to pursue.

While the Attorney General warned against uniform cost as to any items of expense, he stated that "there is no apparent objection to a standard system of cost accounting."

Similar Advertising Condemned

The claim of the Attorney General that co-operative advertising for the purpose of extending markets on particular articles through an association which is identified by special trade labels, designs and trademarks would establish uniformity of prices, is based upon the belief that "where two competing articles are advertised in precisely the same way, and bear exactly the same label or trademark, it certainly would be difficult for one to be sold at a higher price than the other, although its quality may be superior." Therefore, the Attorney General suggested to Mr. Hoover that it would be well to eliminate the following phraseology "and may the association engage in such form of promotion by furnishing trade labels, designs and trademarks for the use of its individual members."

TY COBB TIRE IN BANKRUPTCY

AUGUSTA, GA., Feb. 14—The Ty Cobb Tire Co., of this city, a dealer organization formed and largely owned by Tyrus Raymond Cobb, premier star of the diamond, about two years ago, has filed a voluntary petition in bankruptcy. Liabilities are $37,423.27, with assets at $21,466.72. Cobb took an active interest in the business during the winter months he spent at his home here.

Parts Makers Hear Encouraging Reports

Steady Progress Predicted with Truck Business Showing Pronounced Gains

NEW YORK, Feb. 14—More encouraging reports than have been heard in months were made by credit men of representative parts manufacturers at a group meeting last week. Almost without exception they declared business for January was greatly in excess of January, 1921, and that February is almost certain to be still better. They expect the first quarter at least to show a material gain and it is the general belief that the year will be one of gradual but steady progress.

Most of the business at present is coming from manufacturers of the more popular lines of passengar cars but many inquiries have been received recently from truck manufacturers and indications now are that the gains in the truck field later in the year will be more pronounced than in the motor car branch of the industry.

Following are paraphrases of some of the reports on business conditions made by a number of representatives of large companies.

Opinions Reflect Conditions

"January business was the best for three months and February releases are four times as large as last month. Prospects for March are fair and we expect a steady improvement throughout the year."

"January was considerably better than a year ago and better than December. February releases are running much better. We believe that business will steadily improve."

"Our production now is from 70 per cent to 80 per cent of the peak reached in 1919."

"January was 50 per cent better than last year and 50 per cent of normal. We expect February to be nearly a normal month and are quite confident of the future."

"January releases were better than in December and February will be better than January."

"January was three times better than last January and 15 per cent ahead of December. We look for a steady improvement up to April and expect to be operating at 50 per cent of capacity by that time."

"January was three times as good as last January and much ahead of November or December. February shows a considerable further improvement which we expect will continue. March promises to be better than February and April and May still better. We are running from 45 per cent to 50 per cent of capacity."

"We expect good business for the first four months of the year at least. January was away ahead of last January while February, March and April look a lot better."

"January business was 300 per cent of January last year and February will be better than January."

"Our production now is up to 45 per cent of capacity and orders now on the book will make it 50 per cent."

"January was far ahead of the previous months."

South Africa Sales Increasing Rapidly

Some Dealers Describe Condition as Boom—Much Interest in Automobiles

JOHANNESBURG, Dec. 20 (*By Mail*) Christmas in the United States means cold weather and a time of the year not best suited to motoring. In South Africa it means hot, dry weather, as a rule, and everyone wants to get out into the country. It is not surprising, therefore, to learn that the automotive business has picked up during the last two or three months. One or two dealers describe the present state of things as a "boom" and while this may be an extravagant statement of conditions there is a general feeling that things are more settled and that 1922 will mean a year of steady business for the automotive industry in South Africa.

Intensive Selling Campaigns

Dealers find that by intensive selling campaigns they can make their business pay. Reports from the country districts go to show renewed business activity. Many farmers are now buying cars because they have managed to dispose of their maize or wool, perhaps at a loss, but they have realized ready cash.

One outstanding feature in the automotive industry here is that the farmer at last has realized the necessity of owning an automobile and the result is that the car is now definitely established. Only the fact that the farmers have had no ready money has prevented a large number of car sales. But to-day farmers are making inquiries and some are placing deposits on prospective purchases. Some are buying on the "hire-purchase" plan and the banks are a little easier in respect to financing car deals than they were a few months ago.

For a colony, South Africa has a good number of cars per capita but there is room for many more, and 1922 will see a tremendous increase in the number of cars in the country districts. The Standard Motor Co. of Africa, Ltd., handling the Nash throughout the sub-continent, reports inquiries for cars in the eastern Transvaal and a large number of actual sales.

Trying Out Stanley Steam

Hupp Garages, Ltd., sold 24 cars in November, mostly for cash. The Overland four has been selling well and Dodge has sold on an average of one a day for the last two or three months and has orders booked ahead.

The first Stanley steam car arrived here a few days ago and is now being tried out on South African roads. A great deal of interest has been taken in this steam car and crowds are attracted to it whenever it stops. It is certain that a number of buyers can readily be found for it. The model exhibited is a four passenger but it is thought that the five or seven passenger will be more suitable. New model Fiats, 16 hp. and 30 hp. models, have arrived and are now being demonstrated. The 1922 Buick has just arrived as also has the latest model Reo, 7-passenger car.

The latest Hudson has also come to hand and is selling well. The sporting model appears to be most popular. Williams, Hunt & Co. has disposed of its Chevrolets and is now awaiting a new shipment. Prices are lowered on this new shipment.

There have been a large number of competitions, cars and motorcycles, lately and public interest in them is very gratifying. There is talk of building a race track three or four miles outside the city. This may be done early in 1922.

—M. EDWARD.

Ford Moves in Argentina and Doubles Old Capacity

BUENOS AIRES, ARGENTINA, Jan. 16 (*by mail*)—The local assembly branch of the Ford Motor Co. has been moved from its old quarters to a modern new plant having a capacity of 25,000 cars and trucks yearly. This practically doubles the capacity of the former branch, which consisted of several old buildings. The new plant is modern in every respect.

DETROIT, MICH., Feb. 11—The new Ford assembly branch at Buenos Aires is the most important unit of the company in South America. The assembly system in the new plant has been laid out to compare with the best of American plants. There was little car stocking in Argentina, the Highland Park factory making steady shipments of knockdown parts throughout 1921 and so far into 1922. Heavy shipments of Ford parts to Argentina began last September and has been continued. The business outlook for the branch is considered very good, this being shown by the fact that the company has moved into its new branch.

Australian Firm to Make Car from British Parts

LOS ANGELES, Feb. 14.—The Australian British Motors, Ltd., of Sydney, Australia, has been formed to manufacture the Southern Six which will be marketed in the British colonial possession in the Pacific.

The car will be assembled of British parts. The engine will be six-cylinder, valve-in-head, overhead camshaft, type with 2⅞ in. bore and 3¾ in stroke. A zenith carbureter and magneto ignition are employed. A three-speed gearset and full floating rear axle with torque tube are used. There is a Brolt starting and lighting set. The rear springs are cantilever and both front and rear springs are covered with grease-filled leather gaiters.

The ground clearance is 10½ in. The radiator and cooling system is about half again as large as that usually fitted to cars of this size. The chassis weight is estimated at 1800 lbs.

Erie Road Favors Rail Commissioner

Representative States Motor Vehicle Should Be Considered an Adjunct, Not Competitor

WASHINGTON, Feb. 10—Need for a separate, impartial, individual transportation authority or body was advocated to-day by T. C. Powell of the Erie railroad, in supporting the proposal of the Railroad Committee of the Chamber of Commerce of the United States to create a commissioner general of railroads.

Admitting that motor truck competition is a vital problem, Powell told the conference that "the automobile properly considered is an adjunct of the railroad; wrongly considered, it is a competitor." He insisted that it would be impossible for motor vehicles to force rail carriers out of business, although admitting this form of transportation rendered useless several hundred miles of short lines.

Powell stated that the influence of motor trucks on rail rates has been over estimated and that the public was generally misinformed as to this phase of the transportation system. He does not believe that the truck will ever prove a serious competitor with railroads on long haul traffic. He said in part:

It is true the row boat is still in existence, but I doubt very much whether anybody sees very many of the rowboats. Most of them use motor boats. It is true that motor trucks will not drive the railroads out of business, but they have succeeded in driving out hundreds of miles of railroads. There are less miles today than there were in 1906 when we reached the apex of our construction. When the stage coach reached its perfection as a stage coach in England it commenced to decline, because something better came in—the railroad.

If the railroad comes to a point where it cannot handle the short-haul traffic through any cause whatever, length of time occupied, cost of service, cost of handling at terminals, that is the time for the motor truck; but who is to declare in an impartial way whether the motor truck or the railroad is the one to survive on that traffic? There is no separate impartial individual or body today that can do that.

Elliott, Who Invented New Type of Gear, Dies

NEWTON, MASS., Feb. 13—Sterling Elliott, inventor of a type of automobile steering gear, died at his home here today at the age of 70. At the time of his death he was the president of the Elliott Addressing Machine Co.

Elliott invented and patented a motor tricycle, one of the features of which was a steering gear of new design. The tricycle had two front steering wheels, the ends of the front axle being yoked and steering knuckles connected to the yoked axle ends by means of pivot pins. This latter became the favorite construction for automobile front axles, and royalties were paid Elliott under his patent by axle makers.

Motor Tax Protests Flooding Washington

Industry Argues Against Class Legislation—Proposed Levy Apparently Killed

(*Continued from page* 432)

From the standpoint of officials of the National Automobile Chamber of Commerce, these taxes are unjust, because it is an effort to throw a burden of national obligation upon one or two industries. Beyond this, the Chamber officials point out that the industry is already subjected to special taxes amounting to more than 300 million dollars annually at a time when every manufacturer is searching for ways and means of cutting even a few dollars from the cost of his product in order to widen his purchasing field.

The statement that the taxes are levied because the government is returning 100 million dollars annually to the industry for better highways, is met by the statement that more than that amount is now being paid into the Federal Treasury in excise taxes, while figures recently prepared show that the motor vehicle owners of the United States are paying an annual charge of $19 a car, while the total amount appropriated for road maintenance in this country by county, state and national authorities is only $18.35 per car.

Hanch Criticizes Plan

C. C. Hanch, chairman of the taxation committee of the National Automobile Chamber of Commerce, was unsparing in his criticism of the sources of revenue proposed to meet the bonus. He said:

The imposition of the tax would be the proverbial last straw. When the present excise taxes were levied it was positively stated that they were for war emergency purposes and that they would be repealed when the war was over. Instead, we are now faced with further charges.

The only possible consequence of further taxes at this time will be further unemployment and the clogging of the wheels of business. It is a strange commentary that a Republican party having for its slogan "Less government in business" and presumably charged with the purpose of returning to normalcy as soon as possible should seek to impose confiscatory charges upon the largest manufacturing industry of finished products in the United States.

Associations Act

NEW YORK, Feb. 14—Telegrams were sent Sunday by the National Automobile Chamber of Commerce and the Motor and Accessory Manufacturers Association to all their members urging them to get in touch with their representatives in Congress, either by telegraph or telephone, to register their strong disapproval of the proposed taxes on gasoline and automobiles. It was pointed out that these additional burdens, if enacted, would add materially to sales resistance.

ST. LOUIS, Feb. 13—Telegraphic protest to Congress against the imposition of further taxes on the automobile or on gasoline to pay for the soldier bonus was made to-day by the board of directors of the National Automobile Dealers' Association at a special meeting called at headquarters.

The 45,000 automobile dealers of the country whose interests are represented by the association will be asked to use every effort to oppose levying of the proposed taxes on the industry. A general sales tax is suggested as a substitute for the special class taxes suggested.

Bankers Engaged on Plan to Reorganize Republic

CHICAGO, Feb. 15—A bankers' committee headed by Charles N. Gilbert vice-president of the First National Bank has taken a hand in Republic Motor truck affairs with a view to working out a reorganization plan. Several meetings have been held here and an announcement is expected within a few days.

The company announced late in November that it had completed arrangements for deposits and extensions of $500,000, 7 per cent first mortgage notes matured, out of a total issue of $2,500,000, and a voting trust committee was formed with which preferred and common stockholders were asked to deposit their holdings.

Its plan contemplated a five year extension of the entire amount, with rate increased to 8 per cent, the company to redeem $300,000 annually, starting Nov. 1, 1923, depositing noteholders having the privilege of purchasing common at 8 to the extent of 10 shares for each $1000 note. Approximately 70 per cent of notes have been deposited to date and bankers are endeavoring to secure the remainder.

LOCOMOBILE WORK UNHAMPERED

BRIDGEPORT, CONN., Feb. 15—Operations in the factory of the Locomobile Co., are continuing unhampered during the receivership and a steady volume of business is being received, although officers of the company had expected a lull. Managers of the branches at New York, Boston, Philadelphia, Los Angeles and San Francisco have been appointed ancillary receivers for the property in those districts. In Chicago the Central Trust Co. has been selected to administer the company's affairs.

RECEIVERS TO SELL SPACKE

INDIANAPOLIS Feb. 13—Robert M. Feustel and Chas. O. Roemler, of this city, receivers for the Spacke Machine & Tool Co., are advertising for bids for the assets of the company, which include the automobile and axle factories, machinery, equipment, inventory and accessories.

The receivers are authorized by the court to receive bids for the business as a going concern as a whole, or the axle plant or automobile factory in separate units, or any part of either.

Ford Dealers Will Sell Lincoln Cars

Branches Investigating Field Possibilities—Factory Methods Being Surveyed

DETROIT, Feb. 15—Official announcement of its sales and manufacturing policies under the Ford regime has been deferred by the Lincoln Motor Co. pending the working out of a few remaining details, but it is evident from the results thus far accomplished that sales in the larger cities of the country will continue to be through the present distributor organization.

In the smaller cities the Lincoln dealers and the Ford dealers who will be authorized to sell Lincoln cars will operate directly under factory control through the medium of the branch plants. In the big cities the present distributors will conduct retail salesrooms and will distribute to Ford dealers, whom they authorize in their cities.

Investigations are now being made by the 35 branch Ford plants of the possibilities for the sale of the Lincoln cars in their individual territories and their recommendations will play a large part in the dealer authorizations. Changes will be made in many localities, but the efficient dealers will continue to function.

Production Methods Studied

Much of the detail of the sales plan was laid before a meeting of prominent Lincoln distributors at the factory this week, which was attended and presided over by sales executives of both the Lincoln and Ford organizations. For the time being, apparently, the Ford sales organization has been allowed to function by itself, while the executives give all their study to the Lincoln problems.

Manufacturing at the plant is under the observation of Charles C. Sorensen, the Ford chief of manufacturing operations, and changes which will be made in production methods will follow his recommendations. For the present the plant is working on a schedule of 20 to 30 cars daily, which will be continued until the production changes are fully determined.

LINCOLN DELAWARE ASSETS

WILMINGTON DEL. Feb. 15—James I. Boyce of this city and the Detroit Trust Co. appraisers of the Delaware assets of the Lincoln Motor Co. have appraised the notes, drafts and accounts receivable of the company at $54,775 although their book value is $354,171. The shrinkage is the result in part of failures by dealers. No valuation has been placed on the patents and trade marks.

MOTORIZING POLICE

INDIANAPOLIS, Feb. 11—A thorough motorization of the Indianapolis police department will be sought by Mayor Lewis Shank.

Middle West Shows Reviving Interest

Country Dealers Returning to Market—Credit Conditions Seem to Be Easier

By James Dalton

NEW YORK, Feb. 14—Further evidence of public interest in automobiles is found in the unexpectedly large attendance at the Minneapolis show last week and at Kansas City this week. These sections, hard hit by the business depression, have demonstrated that the demand for automobiles will increase steadily as general conditions improve. That improvement is now under way.

One of the interesting developments at these shows was that many country dealers who have not stocked cars for months are back in the market in a small way. This shows that credit is easier and that their confidence has returned.

A better tone in the market also is reported from most sections of the South. No great improvement is expected in the next two or three months, but the general trend will be upward and substantial sales are expected later in the year.

Production Spotty

Production at the factories is somewhat spotty, especially in those which produce cars in the lower price classes. A notable exception is Dodge, which expects to be turning out 600 cars a day before March 1. Ford is working on an average of four days a week. Factories in the medium price class are coming slowly into heavier production. In the higher price class, Cadillac is running practically at capacity and Lincoln has been deluged with business since Ford took control and prices were reduced, although the reductions were not as large as had been expected.

Reports of better truck sales are becoming more general and production is increasing. This is true both in industrial and agricultural sections. The ratio of gain over the corresponding period last year probably is larger than in the passenger car field. Development of the co-operative marketing movement for farmers, which was approved by the Senate last week, will open a large truck market.

Reductions in the lower price tractor field, following the lead of Ford, are becoming general. This indicates an expanding demand and keener competition.

Developments in all the branches of the industry are enlarging the business of parts and accessory makers. Their sales for January will show a gain over December and this month is expected to be even better. Sales to jobbers, which have been good for months, are holding their own and collections, generally speaking, are satisfactory. Even if passenger car production is no larger this year than last, the business of parts manufacturers will be better because car makers have worked off their heavy inventories.

One of the engineering trends of the year will be in the direction of fuel economy and lower operating costs. Low gasoline and upkeep expense now constitute an important talking point in salesmanship.

Manufacturers have taken up in earnest plans to help their dealers solve the used car problem and substantial progress in this direction is being made.

Bank Executive Chosen to Head Braender Tire

RUTHERFORD, N. J., Feb. 14—J. K. Watson of the Rutherford National Bank has been elected president and treasurer of the reorganized Braender Rubber & Tire Co. Other officers elected are: F. L. Braender, vice-president in charge of purchase and production; W. P. Braender, vice-president in charge of sales; M. E. Morris, vice-president and general manager; Milton Damman, secretary, and Harry Breander, assistant secretary.

Morris formerly was assistant general manager of the Goodyear Tire & Rubber Co. of California.

The company now is in a strong financial position, having current assets of $299,000 against direct liabilities of $6,117. The plant, valued at $585,000, is unencumbered.

Stockholders May Dissolve Chevrolet Holding Company

WILMINGTON, DELAWARE, Feb. 13—Stockholders of the Chevrolet Motor Co. of Delaware, which has been the holding company for the General Motors Corp. stock owned by the duPont interests, will meet May 8 to act on the proposed dissolution of the company. The transaction will be merely a formality and concerns only complicated financial transaction.

It will have no effect whatever on the manufacturing activities of the Chevrolet division.

ELECTRIC SHOW IN APRIL

NEW YORK, Feb. 13.—The electric automobile show for 1922 will be held in the Irving Place show room of the New York Edison Co. from April 3 to 15. The first week will be devoted to street trucks and passenger cars while the second week will be given over to industrial trucks.

Willys Corp. Counsel Working on Claims

Will Figure in Final Adjustment —Miniger Tells of Work Done Under Receivership

TOLEDO, Feb. 13—The Willys Corp. is making good progress under the receivership, according to Receivers C. O. Miniger and Frank Kennison. Miniger has returned from a week spent in Elizabeth, N. J., and New York.

"We are operating the Electric Auto-Lite division and the New Process Gear Corp. at a profit, and have cut the charges for carrying the big Elizabeth plant down to the absolute minimum," Miniger declared.

"We are negotiating for the sale of the Elizabeth plant. J. R. Harbeck, down there, has several deals in process and it may take about sixty days for any one plan to be consummated. That's a matter of elimination.

"The audit of the books of the corporation will probably be completed in a few weeks."

Sale of Securities Indefinite

Miniger said that when the time came to lift the receivership it would probably be a question as to whether the securities held by the corporation or its operating units should be sold—a matter for the courts to determine.

He said that at the present time undoubtedly the operating units could be sold at the least sacrifice.

Attorney George P. Hahn, Toledo, is working now upon a couple of claims which the Willys Corp. will seek to have adjusted with the Willys-Overland Co., and which is expected to mean much in the final disposition of the affairs of the corporation.

It is understood that one of these claims is on a contract involving the production of the Chrysler Six model by the Overland engineers and sales of the car by the Willys-Overland Co., on which claim the corporation will seek to collect about $2,000,000.

Seek to Recover on Stock Sale

The other is a claim based upon the sale of common stock of the Overland to the corporation. The sale was made at $18 a share and a few weeks after the stock dropped in market value to $6. The corporation attorneys believe they have a claim of something in the neighborhood of $5,000,000 on this item.

There are many moot questions involved in the claims, however. The settlement of them will probably precede any re-financing on the part of the Willys-Overland Co.

It is thought the proceeds of claims and the sale of the Elizabeth plant will be sufficient to take care of the bank creditors and that securities held by the corporation may be enough to cover the claims of preferred stockholders.

(*Continued on page* 443)

Appoints Receiver for Crow-Elkhart

No Reorganization Probable — Assets Placed at Less Than $350,000

ELKHART IND., Feb. 14—E. A. Skinner, attorney for the Crow-Elkhart Motor Corp., for which former Mayor William E. Wider has been appointed receiver, said to-day there was hardly a possibility of any attempt at reorganization. The corporation's assets he estimated at between $300,000 and $350,000 and its liabilities at $750,000. Wider said he was unable to give a detailed statement of assets and liabilities, as he had not yet begun the active work of digging into the concern's affairs.

The receivership was granted by the Elkhart Superior Court upon petition of the Manrow Sheet Metal Works of Goshen, Ind., which has a claim of $1,132, evidenced by notes alleged to be overdue and demands judgment for $2,500.

Liabilities $750,000

At the time Judge William B. Hile granted the Manrow petition another petition for a receivership already was on file in the clerk's office, without the knowledge of the court. This had been filed an hour before by George W. Fleming of Elkhart, a stockholder whose interest is said to be only about $200.

The corporation's assets consist of grounds and buildings here, materials and finished stock on hand. The liabilities consist of a $600,000 bond mortgage and accounts payable aggregating $150,000. Attorney Skinner said there probably were 3400 stockholders scattered throughout the country, and there were no large individual creditors, besides bondholders and owners of stock, possibly none having claims exceeding $2,500. These creditors, he also said, were widely scattered.

The Crow-Elkhart Corp. was organized under the laws of Arizona in 1917, with an authorized capitalization of $10,000,000. The charter grants permission to issue 1,000,000 shares of $10 par value. All but $2,800,000 was issued, and turned over to stockholders of the Crow-Elkhart Motor Car Co., share for share in that company, after it became bankrupt in 1918, and it was reorganized as the Crow-Elkhart Motor Corp.

Low Prices for Stock

The holders of stock, as individuals, offered it for sale here and elsewhere. Not much of it was disposed of, it is said, although it was placed on the market at a much lower figure than its par value.

It was reported here to-day that the stock was quoted here as low as $1 per $10 share, and that, generally speaking, it did not bring over $1.10. About one-half of the sum realized on the $600,000 bond issue was used to pay creditors of the Crow-Elkhart Motor Car Co. the 25 per cent promised them in the composition which was effected between them and the company. The remainder of proceeds of the bond sale was used in the business of corporation.

The bond issue is secured by a mortgage on buildings, grounds and all personal property of the corporation. The heaviest individual bondholder is said to be J. A. Harps of Greenfield, Ohio, whose original holdings are stated to have been $160,000. It is understood he sold some of these to his friends.

Most of the other bonds are held by members of a syndicate that purchased the interest of M. E. and E. C. Crow of Elkhart in December 1919. This syndicate, it is said, includes, C. B. Lair of Greenfield, Robert Mills of Springfield, Ohio, M. F. Miller of Wadsworth, Ohio, R. B. Donaldson of Lockport, N. Y., and P. T. Longacher of this city.

Hart became president of the corporation, and Donaldson vice-president, general manager and treasurer. This organization lasted until the annual meeting in January 1921, when Austin C. Hayes of Boston, representing financiers who had become interested in an attempted bond sale for the corporation, was made president. He held the office until June of that year when he resigned and M. E. Hoshaw was elected president, in which office he continued.

MICHIGAN SALES IN 6 MONTHS TOTALED MORE THAN REST OF COUNTRY COMBINED

WASHINGTON, Feb. 14—Analysis of internal revenue receipts from the sale of motor vehicles and accessories for the six months ended Dec. 31 shows that the aggregate returns from Michigan far exceeded all the rest of the country put together. The following table shows the receipts from the states which lead in automotive production:

	Automobile Trucks and Wagons	Other Automobile and Motor Cycles	Tires or Accessories for Automobiles
Illinois	$202,572	$501,116	$1,050,018
Indiana	131,583	3,827,478	752,670
Massachusetts	22,466	129,282	1,231,498
Michigan	1,537,851	18,285,897	6,706,103
New York	646,119	2,369,093	3,088,331
Ohio	473,114	2,384,253	6,927,003
Pennsylvania	217,917	159,013	1,455,692
Wisconsin	615,181	301,399	604,095

DEERE MAKES $775 CUT

MOLINE, ILL., Feb. 14—Deere & Co. has reduced the price on its tractor, Waterloo Boy, Model N-12-25, from $1,450 to $675. This price includes the tractor fully equipped. As in other cases of tractor price reduction, the company declares that there is no justification for the reduction based upon the present cost of production.

TEMPLAR TO INCREASE PRICE

CLEVELAND, Feb. 15—The Templar Motors Corp. announces that the prices on its various models will be increased, effective March 1. The new prices have not yet been made public. President Bramley asserts that "pre-war prices, to which the Templar had returned months ago, are too low."

Packard Makes Price Cut on Twin-Six and Trucks

DETROIT, Feb. 14—The Packard Motor Car Co. has made downward revisions in the prices of its Twin-Six models ranging from $1,000 to $1,400. The prices are as follows:

	Old Price	New Price
Touring car	$4,850	$3,850
Sedan	6,800	5,400
Coupe	6,600	5,240
Limousine	6,650	5,275

The prices of the truck Model EC, 2- to 2½-ton, solid tires, has been reduced from $3,500 to $3,100 and of EX, 2- to 2½-ton, pneumatic tires, from $4,000 to $3,500.

ELGIN TOURING LOWER

CHICAGO, Feb. 11—The Elgin Motor Car Corp. has priced its new touring car at $1,695. Prices given out at the New York Show for this new Model 700 were the prices on the old line of cars. This price is f.o.b. factory at Argo, Ill.

CRAWFORD INCREASES

HAGERSTOWN, MD., Feb. 15—The Crawford Automobile Co. has increased the price of its 2, 5 and 7-passenger touring cars from $2,750 to $3,000. The price of the coupe and sedan remains unchanged at $4,500.

BIDDLE PRICES REDUCED

NEW YORK, Feb. 15—The Biddle-Crane Motor Car Co., Inc., has made the following reductions in prices:

	Old Price	New Price
2-passenger Touring	$3,475	$2,950
4-passenger Touring	3,475	2,950
Coupe and Sedan	4,350	3,950

CANADIAN TIRE TARIFF

OTTAWA, ONT., Feb. 14—Canadian Trade Commissioner G. R. Stevens writing from Kingston, Jamaica, on the tire and tube trade in that section, states he expects that when the Legislative Council meets, a preferential tariff on Canadian goods will be adopted giving a 5 per cent ad valorem preference over goods of American manufacture.

Ford Drops Tractor Making at Hamilton

Turns Factory Over to Manufacturing and Assembling Motor Car Parts

HAMILTON, OHIO, Feb. 14—Official announcement was made here to-day that the Hamilton plant of the Ford Motor Co. has been discontinued for the making of tractors and that hereafter motor car parts will be made and assembled. Machinery used in the manufacture of tractors has been sent to the River Rouge plant, and it is the plan of the Ford company, it is stated, to concentrate its tractor efforts in the one factory.

The Hamilton plant is being equipped for the manufacture of wheels. A number already have been turned out and it is stated that within 60 days the output will reach 300 sets daily. This total will be gradually increased until it is hoped that all wheels used for Ford cars will be made here. This will total 4000 sets, local officials said.

Former employees who were engaged in the tractor assembling division, are being called in, and about 100 are employed now. It will require, according to officials about 150 men when 300 sets are manufactured, and the indications now are that the local plant, when running full force and to capacity, will employ more than 7000 men. It is reported that other extensions may bring this force ultimately to a much higher figure.

In addition to making wheels, the local plant also will be used immediately for the making of locks for Ford cars.

Ford's investment here includes a million dollar hydro-electric plant. His total investment is about $3,000,000, and his land holdings are sufficient to allow for more than quadrupling of his present plant.

Producing 100 Daily

DETROIT, Feb. 14—Fordson tractor production of 100 daily has been entered upon at River Rouge following the reduction in price to $395. This is heavier production for the season than in any previous year. It is expected to exceed the 36,000 production of 1921 under the stimulus of lowered prices, which are said by executives to have stirred renewed farm buying.

February marks the anniversary of tractor production at River Rouge, the work having been taken over from the Dearborn plant a year ago. In the year that has elapsed, officials say many improvements have been made in production methods which are largely responsible for the lowered prices.

PYRENE MAKING CHAINS

BUFFALO, Feb. 13—The Pyrene Manufacturing Co. of New York, which controls the Off and On Chain Corp., has purchased three buildings from the Wickwire Spencer Steel Corp. and transformed them into a chain-making plant which already is in production. The special merits claimed for the chain are the rust-proof locking device, the eccentric lever on the locking device which acts as a tightener, and the detachable cross link section which can be detached and replaced without the use of tools. The chains will be marketed through the Pyrene sales organization.

ATLANTA PUBLIC BUYS, DEALERS ORDER CARS

ATLANTA, Feb. 15—Total sales at retail for the first three days of the Atlanta automobile show exceeded the total of the entire show last year by about 10 cars. The bonafide sales for the first three days aggregated about 90. The attendance is 30 per cent better than last year, and the dealer attendance from all parts of the South is 50 per cent larger. Dealers are placing substantial orders for immediate delivery in anticipation of a good volume of spring sales

Ford Car and Truck Output, 85,203, at Foreign Factories

DETROIT, Feb. 15—Ford Motor Co. reports 1921 production of foreign plants as follows: Canada and export territory under Ford, Ontario plant, 42,343 cars and trucks; Manchester, Buenos Aires, Copenhagen, Bordeaux, Sao Paulo and Cadiz, combined total 42,860.

Buenos Aires plant assembled close to 1000 cars during December, a considerable increase over November, and Sao Paulo, the report says, had an increase during December. During 1921 Buenos Aires built more than 6000 cars, Copenhagen 5517, Bordeaux more than 2000.

The greatest month's production of the Canadian Ford plant was May, when 6711 cars and trucks were produced. Cork, Ireland, tractor plant built 1347 Fordsons, the highest month being September.

The high domestic output was for the months of May, June, July and August, when 626,712 cars and trucks were produced at Detroit.

Drive Against Car Thief May Be National in Scope

ALBANY, Feb. 14—A systematized national drive against the automobile thief may be the outcome of a nationwide survey just completed by the New York State Conference of Mayors. Data gathered from police heads of leading cities of the United States are to be used.

The general note of the communications received from police chiefs is that licensing of dealers, both in new and used cars, eliminates much of the mysterious underground network by which automobile thieves are able to remake and resell their cars through supposedly reputable dealers.

Kansas City Makes New Selling Start

Show Indicates Reorganization—Banking Situation Relieved Through Movement of Crops

KANSAS CITY, Feb. 14—The Kansas City automobile show seems to have started a reorganization of selling in this territory. Distributors and branches are planning close co-operation with dealers, and there are prospects of quite a bit of business, not only in cars, but in trucks which have been selling more strongly in January and February than in any recent period.

The show is offering, however, perhaps the strongest evidence of any yet held of the sentiment of the great grain areas towards motor car purchasing. The attendance is not up to last year, and even reduced railroad fares have failed to bring a large number of visitors from the surrounding country. It is apparent that products of the industry sold this year, up to harvest time at least, will have to be sold against strong resistance.

There are more territorial dealers at the show this year than last, which is an encouraging sign in face of the heavy mortality in 1921. It is evidenced that there will be a revival of the selling effort in many towns where it vanished when the countryside felt the full force of the stunning blow of agricultural deflation.

Grain Prices Are Higher

There is much encouragement in the rise of prices of grain and live stock, particularly corn, hogs and lambs. The higher grain prices have come after farmers have disposed of all but 20 per cent of their holdings, and there is a strong disposition to believe that the higher price is only temporary and due somewhat to manipulation.

The fact remains, however, that farm produce is moving out of the territory and money is flowing in. The psychological as well as the financial effect on the farmers will promote some buying, particularly in states of the North and East. The movement of crops and live stock has started a trend toward liquidation on farm indebtedness which is relieving the banking situation and paving the way for easier credit.

SEEK ACTION ON HICKS BILL

WASHINGTON, Feb. 15—Every effort will be made to obtain favorable report in the House on the Hicks bill which would create a bureau of aeronautics in the Department of Commerce. The Wadsworth bill, a similar measure, was approved by the Senate Tuesday after it was amended by striking out a section which would have recognized as pilots in interstate flying those pilots who had been licensed under State laws. The effect of the amendment would be to require a Federal license.

MEN OF THE INDUSTRY

George C. Morgan, who has been assistant general manager of Earl Motors, Inc., Jackson, Mich., has been promoted to sales manager. **D. Minard Shaw,** in addition to his duties as advertising manager, will assume those of assistant general sales manager. Morgan has been in the automotive field since 1910, when he became a field man for the old Thomas B. Jeffrey Co. of Kenosha. He was manager of truck sales for Jeffrey when he resigned to join Willys-Overland as office manager. He later became manager of the Overland branch at Toledo, after which he joined the Citizens Motor Co. of Cincinnati, distributer for Packard and Willys-Overland in three states. Shaw entered the advertising field in 1897, but in the fall of 1917 switched to the selling end as manager of the Herff Motor Corp., distributer of Briscoe and Fiat cars at Memphis and Nashville. Early last year he became division manager and later advertising manager.

Arthur T. Stanton, associated with Dodge Brothers nearly half of the 17 years he has spent in the industry, has joined the executive staff of the Maxwell-Chalmers organization as director of service. He left the Dodge factory organization to become Dodge distributor in Akron and attributed his success there to the quality of service given owners. Prior to that time he was assistant to Arthur E. Barker, the present Maxwell-Chalmers sales manager. Early in 1915 Stanton was given complete supervision of Dodge affairs in England with headquarters in London. He returned to the United States when the British placed an embargo on motor cars and served as Dodge representative in the Cleveland district. In his new position he will concern himself with standardization of dealers' service to owners.

W. J. Rennick has been named secretary and treasurer of the McKone Tire & Rubber Co., with headquarters at Millersburg, Ohio. For many years Rennick was associated with the Miller Rubber Co., more recently as assistant to the general sales manager. His appointment means the removal of the general offices to Millersburg, although the sales offices will continue to be in Chicago.

E. E. Warfield has been appointed sales manager of the Gill Manufacturing Co., Chicago. He has had a long experience in sales work with the industry, having been connected with Post & Lester, Motor Car Equipment Co., Wetmore Savage and other jobbing houses. For the last two years he served with the Boston branch of the Gill company.

Gilbert U. Radoye, director of advertising of the Haynes Automobile Co., has been appointed to the additional position of director of sales promotion. Radoye, who has been associated with the Haynes company for some time, has had a varied and extensive experience in the sales promotion and merchandising field.

E. H. Priebe, until recently one of the general foremen in the manufacturing building of the main plant of the Cadillac Motor Car Co., Detroit, where Cadillac bodies are built, has taken over the duties of superintendent of plant there. He has been associated with the company for the last eighteen years.

George F. Lord has been appointed advertising manager of the Chevrolet Motor Co. **J. H. Newmark** of General Motors Corp., formerly handling this work, will devote his attention exclusively to general advertising of the corporation.

W. H. Stevens, handling the Earl and National in New England, who was joined recently by James C. Clarke, formerly sales manager of the National at Indianapolis, has secured distribution of the Rickenbacker for New England.

A. W. Sawyer, advertising manager of the Hart-Parr Co. for the last three years, has become associated with the Cramer-Krasselt Co., Milwaukee, and will assume his new duties within the next ten days.

Rex Glasson has been placed in charge of advertising of the Gray Motor Corp.

Reach Few Conclusions in Agricultural Report

WASHINGTON, Feb. 15—Windsor D. White, representing the National Automobile Chamber of Commerce, will confer with transportation experts here Thursday and Friday preparatory to writing the final draft of a survey of motor transportation for the Joint Committee on Agricultural Inquiry of Congress. The report will be submitted to Chairman Anderson on Feb. 27, and will contain data on all phases of motor transport and transportation. It is almost exclusively statistical findings of facts and few conclusions are mentioned because of the desire to avoid controversy.

The survey covered relative costs of hauling farm products from farm to market; store door delivery by motor truck; use of motor truck at terminals and commercial uses. Data has been gathered from reliable sources and compiled under the direction of the advisory committee of the transportation section of the joint commission. This information will be used by the committee in its report on transportation questions as relates to agriculture. The Bureau of Public Roads also assisted in this work. It is stated that the report will not be available for publication until April or May.

Tractor Demonstrations to Be Held by British

LONDON, Jan. 30 (*By Mail*)—The Agricultural Machinery Section of the British Society of Motor Manufacturers & Traders is organizing a series of tractor demonstrations to be held in various parts of England.

The first is to take place in the southwest, near Exeter, on March 1 and 2, and the regulations are very similar to those which in previous years have applied to the trials. The main difference is that there will be no official observation of the machines in use, no records taken of work done and fuel used and no officially compiled report issued subsequently.

URGE ACTION ON PATENT BILL

NEW YORK, Feb. 13—The Rubber Association of America, Inc., has sent to its members a bulletin urging that they telegraph Senator Hiram Johnson, chairman of the patents' committee, urging that the Senate give precedence to consideration of the Lampert patent office bill which has passed the House and has been favorably reported to the Senate.

Overland Reinforced with New Directors

Toledo Business Men Fill Vacancies—Seen As Part of Refinancing Opposition

TOLEDO, Feb. 15—Important developments preliminary to any attempt by bankers to force a re-financing program upon the Willys-Overland Co. were seen here to-day when four Toledo business men were elected to membership on the board of directors at a special meeting of the board.

President John N. Willys said the new directors were named to comply with an Ohio law, which provided that a majority of the directors of an Ohio corporation must reside in the State.

Henry L. Thompson, president of the Bostwick-Braun Co. and of the W. Bingham Co., Cleveland, W. L. Milner, head of a large department store here; George M. Jones, coal operator and president of the Ohio Savings Bank & Trust Co., and Gordon M. Mather, president of the Mather Spring Co., were elected to the board.

Willys Opposes Bond Issue

These directors take places made vacant through the resignation of Walter P. Chrysler, executive vice-president; C. E. Killenger, superintendent of the Elmira, N. Y., plant; Edward F. Swift, Chicago, and C. B. Mertz of the Willys-Overland Co.

The new board will link the Willys-Overland closer to the general business interests of the community.

Willys has actively opposed the efforts of bankers to impose a bond issue upon the Willys-Overland Co., and it is believed that the new Toledo connections may have some bearing on this point. He has left for the west to confer with sales branches.

Willys Corp. Counsel Working on Claims

(*Continued from page* 440)

The Electric Auto-Lite Corp. at Toledo is now operating on an excellent basis. It is employing about 1500 persons and has been selling its products to a diversified list of passenger car and truck manufacturers in many parts of the country.

TO DETERMINE WILLYS DEBT

SYRACUSE, Feb. 14—Claims of creditors in New York state of the Willys Corp., which three years ago purchased the New Process Gear Co. plant in this city, will be heard by James C. Setright, an attorney of this city, who was named special master by Federal Judge Cooper. The amount of indebtedness of the corporation which is now in receivership is not known, but an effort will be made to determine it in a series of hearings to be held by the special master within the next few weeks.

FINANCIAL NOTES

J. G. Brill Company, Philadelphia, manufacturer of motor truck and omnibus bodies in addition to street cars, reports for 1921 a profit of $163,399, or 3.56 per cent on the $4,580,000 preferred stock, as against 7 per cent on the preferred stock and 22.7 per cent on the $4,810,200 common stock in 1920. Sales and other income totaled $7,647,898, a decrease of $17,537,293, and operating expenses, including depreciation charges, $7,484,498, a decrease of $8,637,473. The surplus after preferred dividends at the close of the year aggregated $2,904,251, a decrease of $446,941. Samuel M. Curween, president, in his report to the stockholders, stated that the company's Canadian plant now has sufficient work to keep it operating at full capacity, and that while the company enters the year with a comparatively small amount of work on hand, there has been great improvement since the first of the year in inquiries received and in the prospects for business which should be placed during the current year. Retiring officers and directors were re-elected.

Deere & Co.'s annual report for the year ended Oct. 31, 1921, shows a loss of $2,752,801 for the year, against net income of $4,636,717. Sales last year dropped 63 per cent from 1920, and it was found impossible to reduce expenses in proportion. During the war period and the years 1919 and 1920 the company created a reserve of $9,409,733 against expected inventory losses due to falling markets. Against this reserve the company has charged off $6,317,059, which represented the decline in inventory values during 1921. The loss from operations plus the reduction in inventory amounted to $9,069,860. President William Butterworth states that owing to business conditions and the fact that the farmers will require longer credits it has been deemed advisable to fund $10,000,000 of the company's current indebtedness into ten-year gold notes.

American Rubber & Tire Co.'s annual statement submitted to the stockholders shows total net assets of $1,781,859 and total owing, in notes and accounts payable, of $523,393. The sales in dollars and cents are reported to equal those of the previous year. The same scheduled rate of production was maintained throughout the year. The losses during the early part of 1921 were more than offset by the profit during the latter half. Dividends have been paid regularly on the preferred stock. Henry L. Houk, general manager, states that although he views the outlook with greater enthusiasm than at any time since 1919 the company would continue to follow a conservative policy.

H. H. Franklin Manufacturing Co. has established a sinking fund, as of Jan. 1, 1922, under the terms of which 15 per cent of the previous year's earnings, after the payment of preferred dividends and taxes, must be set aside. This money may be used to purchase preferred stock shares offered for sale in the open market, or, at the company's option, it may call for retirement shares to the extent of the amount available at the premium price of $110 per share. If any portion of the stock is called for retirement, such shares retired may be drawn by lot. This will have a tendency, the company expects, to stabilize the stock, since the company itself will be in a position to create and establish the market, or at least to purchase any and all stock which is offered at or below par.

International Motor Truck Co.'s net earnings, after charges and taxes, for 1921 did not cover approximately $1,137,000 dividends on both preferred issues. Officials, however, regard it as a satisfactory performance, in view of conditions, that something was earned on the preferred. The company ended the year with $18,000,000 working capital, including $3,500,000 cash. Inventories up to the third quarter had been reduced $3,000,000, to $12,000,000. The final statement may show them less by another $3,000,000. The company has no funded debt or bank indebtedness. A statement covering the operations for the year may be delayed several months by the completion of inventories.

Emerson-Brantingham for the year ended Oct. 31, 1921, reports net loss, after taxes, charges and inventory adjustment, of $3,308,726, which compares with a surplus of $872,703 in the preceding year, $1,322,420 in 1919 and $1,282,268 in 1918.

Favorable Report Is Made of Gramm-Bernstein Affairs

NEW YORK, Feb. 13—A committee representing the merchandise creditors of the Gramm-Bernstein Motor Truck Co. has made a careful investigation at Lima, Ohio, of the company's financial affairs and has made a favorable report. All the banks in Lima spoke in the highest terms of both Gramm and Bernstein, and the City Bank, which holds a considerable amount of the company's paper, does not feel the slightest uneasiness over it and is not urging payment.

A judgment recently taken against Gramm and his wife by the Old National Bank of Lima was merely a technical procedure and was promptly adjusted. The bank now is carrying Gramm's personal notes for the same amount.

The committee also found that no significance could be attached to the fact that Bernstein, who owns nearly $500,000 worth of real estate, recently placed a mortgage for $140,000 on the Harper block. This loan was exclusively for the benefit of the company, and a portion of it was used to pay interest on gold notes. The balance of the amount is being held for emergency use by the truck company.

TO DISCUSS AVIATION LAW

WASHINGTON, Feb. 13—A joint meeting of the special aviation branch of the committee on uniform State laws with the aviation committee of the American Bar Association will be held here Feb. 25 to discuss the requirements of aviation law. The meeting will be open to those interested in the subject of uniform and comprehensive aviation law.

CHEVROLET PLANT FOR BUFFALO

BUFFALO, Feb. 13—Ground will be broken here this week for the assembling plant of the Chevrolet Motor Co., the specifications calling for the completion of the building before May 1. There will be about 40,000 square feet in the structure. It is the purpose of the company, according to Elwood M. Garris, manager for the district, to make Buffalo a distributing center of Chevrolet parts.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

During last week call money ranged from 4½ per cent to 5½ per cent, as compared with 4½ per cent to 6 per cent in the previous week, and funds were in fair supply. The time money market was dull and nominal. The quotations for sixty days' to six months' maturities remained unchanged at 4¾ per cent to 5 per cent. The rate for prime commercial paper also remained unchanged at 4¾ per cent to 5 per cent.

The Federal Reserve statement as of Feb. 8, 1922, showed an increase of $1,111,000 in total reserves, this being due to the following changes: An increase of $9,824,000 in gold reserves and a decrease of $8,713,000 in other legal reserves.

The New York institution showed a decrease of $31,938,000 in total reserves and an increase of $37,407,000 in total bills on hand. Total earning assets increased $62,165,000, while deposits showed a gain of $11,306,000.

The United States Treasury Department has announced that the approximate $400,000,000 outstanding of Victory 3¾ per cent Notes will be called for payment at par and interest on June 15, 1922. This is part of the refunding operations to be carried out in connection with the refinancing of the Government's short-term debt.

The Cleveland Federal Reserve Bank has announced that its rediscount rate on all classes of loans will be 4½ per cent, effective as of Feb. 14. The rate in the Southern and Western districts still remains 5 per cent.

The value of American exports of merchandise for the month of January dropped to the lowest level recorded since August, 1915. The reported value of $279,000,000 shows a decrease of 25.6 per cent from the amount reported for January, 1921.

The unfinished business on the books of the United States Steel Corporation at the close of January, 1922, amounted to 4,241,678 tons, a decrease of 26,736 tons from the total on hand at the close of December, when 4,268,414 tons were reported. This rather unexpected decrease in forward business is explained partly by year-end cancellations. The peak of unfilled tonnage was reached in April, 1917, when bookings amounted to 12,183,083 tons.

TRACTOR CHAIRMEN NAMED

CHICAGO, Feb. 11—The following committee chairmen have been appointed by the tractor and thresher department of the National Association of Farm Equipment Manufacturers: Tractor demonstration show and publicity, H. H. Bates, Bates Machine & Tractor Co.; foreign trade, J. B. Bartholomew, Avery Co.; tractor tests, R. C. Brewsough, Allis Chalmers Manufacturing Co.; educational work, John R. Myers, George O. Richardson Manufacturing Co.

INDUSTRIAL NOTES

Goodyear Tire & Rubber Co. has added 500 men to its working forces and will increase production from 20,000 to 22,000 tires daily. The company went to the previous mark the first of the month, but constantly increasing business makes the increase to the second figure necessary. The proposed output is 2000 tires a day in excess of the program which was expected to be maintained for the balance of the winter. The company is selling surplus machinery which has been made available through increased efficiency of plant operation. Both new and used machinery is being offered for sale.

Stewart-Warner Speedometer Corp.'s volume of business this year is reported the largest on record for the period. The working force of the company is approximately 1600, as compared with 800 last October. Orders have increased materially since the New York automobile show. Heavy orders, it is planned, will be placed for raw materials. It is said that the company is developing several new accessories, including an indicator for the dashboard to register accurately the amount of gasoline received at a service station.

Kelsey Wheel Co. body building plant located in Memphis has started operations after being idle since completion nearly a year ago. The plant was erected under the stimulus of a $1,750,000 contract from the Ford Motor Co. The contract was subsequently canceled owing to the business depression. The company has now concluded negotiations with the Studebaker Corp. Operations start with 50 employees, a number that will be augmented until it reaches 350. C. A. Hooker is in charge.

Asphalt Association has moved its Canadian offices from Toronto to Albany, N. Y., and has placed Germain P. Graham, formerly deputy city engineer of Albany, in charge as district engineer. Graham's territory will include New York State as well as Canada. The association recently opened branch offices at Raleigh, N. C., with Harry P. Grier in charge and at Atlanta, which is under the supervision of James R. Valk.

National Tire & Rubber Co., East Palestine, Ohio, is now operating with its full force and manufacturing tires and tubes to its capacity. The company has its distribution practically all arranged for this season through its distributor organization. From orders already booked and the trade prospects through close affiliation with its distributors it anticipates an active and profitable season.

Wire Wheel Corp. of America has opened up new headquarters in Chicago in the Splitdorf Building, 2900 South Michigan Avenue. Oscar Moll is the manager in charge of the branch, assisted by E. A. Kuhl. The factory representative for the central Western territory, making his headquarters in Chicago, is Ralph D. Webster.

C. W. Arnold Co., Wellsville, Ohio, has purchased the **Cleveland Carburetor Manufacturing Co.** plant and machine shop, together with the rights and all patents for the manufacture of the carburetor, which at present is designed for small cars. The Arnold company expects to operate the plant in the near future.

Resta Motors, Inc., New York City, of which Dario Resta, racing driver, is president, has had a petition in bankruptcy filed against it by three creditors. Resta admits insolvency. The liabilities are reported to be $54,148 and the assets $30,000.

Jordan Motor Car Co. has gone into capacity production with prospects that it will remain so for several months. In the last quarter of 1921 it is reported the business of the company showed an increase of more than 40 per cent.

Greenfield Tap & Die Corp. reports that incoming orders for January, domestic and export, showed an increase of 50 per cent compared with January, 1921.

John Obenberger Forge Co. assets at West Allis will be sold at public auction in the Federal Building, Milwaukee, March 1 by J. W. Gerdis as trustee.

Just Motors, Ltd., has been incorporated with a capital of $400,000. Headquarters will be in Montreal and a branch will be established at Ottawa.

Acme Wire Co., New Haven, reports that it has received an order for 150,000 coils of wire from the Ford Motor Co.

Milburn Electric Adds Two Commercial Models

TOLEDO, Feb. 14—A 1-ton and a ½-ton model have been added to the commercial electrics made by the Milburn Wagon Co. The line of passenger electrics remains as before, a brougham, coupe and roadster.

The smaller model, ½-ton capacity, is known as Model 43 and is priced at $1,585 in chassis without battery. The wheelbase is 115 in. and tires 32x4½ in. Pneumatics are used both front and rear.

The 1-ton model, known as Model 40, sells for $1,985 in chassis without battery. It has a wheelbase of 128 in., 32x4½ tires in front and 33x5 tires in the rear.

Central America Using More Denatured Alcohol

NEW YORK, Feb. 11—The growing use of denatured alcohol as an automobile fuel is reported in advices reaching here from Central America and the West Indies. The Republic of Panama has named a commission to work out plans for creating a national fuel, the commission estimating that alcohol for motor use can be produced locally at a cost of about 20 cents per gallon, compared with 45 to 50 cents per gallon for gasoline. The commission estimates that more than 1500 automobiles are in use in Panama.

Wide use of this fuel already is being made in Cuba, where a daily production of from 12,500 to 15,000 gallons is being carried out under a recent decree authorizing the manufacture of a motor spirit containing 95 per cent alcohol and 5 per cent gasoline, with coloring added to make it easily distinguished. Many Brazilian motorists are reported to be employing this fuel, and one of the entrants in a recent tractor demonstration near Rio de Janiero successfully used it.

BRITISH FIRM'S LOSSES

LONDON, Feb. 4 (*By Mail*)—S. Smith & Sons, Ltd., accessory manufacturers, after paying a steady 10 per cent dividend for the year 1918-19 dropped to 3½ per cent for 1919-20, free of income tax, when a net profit of £98,337 was declared, reports a net loss of £203,985 for the year ended July last.

METAL MARKETS

Compared with the lackadaisical buying of a few weeks ago, the demand for iron and steel that is now before the market may almost be said to have turned brisk. Several 5,000 ton lots of sheets are being inquired for by Michigan automotive interests and there is far more pep to pig iron purchases by automotive foundries than there has been in some time. For all that it would be obliquity of vision to behold in this demand even the remotest justification for any change in the easy tone that characterizes the price situation in general. In fact, every single ton of steel orders now added to the much depleted unfilled tonnage reserve of mills should enable the latter to make a more favorable showing in the gross profit on their operations which are still far from capacity, in most instances representing about one-half of the latter.

There may possibly come to pass an upward revision in the prices of bars, shapes and plates, if the demand for structural steel should broaden, for the simple reason that these products are now selling at what is in many quarters looked upon as the dead line. To be more precise, however, these products are not selling to any great extent at the levels now quoted, for no representative amount of orders is ever placed for any steel product at minimum prices. When these prices undergo upward revision, there is danger of loose talk about "the steel market advancing."

Formerly a certain percentage of defective sheets was accepted in an order by the purchaser but most consumers now insist upon their sheet purchases being 100 per cent perfect and, as a result, sheet mills are bending every effort to eliminate waste in production as the result of carelessness on the part of mill operatives. In the long run producers will be fully as much benefited by this attitude of consumers as will the latter, for it makes for efficiency of the right sort.

Pig Iron.—Considerably more malleable and foundry iron is moving to automotive melters, but buying continues conservatively as to the tonnages involved.

Steel.—The market for cold-drawn steel bars is fairly active with producers quoting 2¢, base Pittsburgh, but orders are generally placed at 1.80 @ 1.90¢. Cold-rolled strip steel is sought in small tonnages by automotive consumers, quotations holding at 3.50¢, base Pittsburgh. Hot-rolled quotations show a wide spread, ranging from 1.80 @ 2¢, base Pittsburgh. Slightly more activity is noted in sheet bars which are quoted at $29, with rumors of transactions at $28. The sheet market, especially that for full-finished automobile sheets is firm, The Ford Motor Co. is reported to have 150,000 tons of scrap in stock. No demand of sizeable proportions has so far developed for bolts and nuts.

Aluminum.—Foundries catering to the automotive industries are more active in the ingot market. one transaction involving 1,000,000 lbs. having recently been noted. The market is steady, especially for sheets. Importers assert that all bargain lots have been cleaned up and that foreign producers refuse to shade prices at this time.

Copper.—The market continues easy. Domestic consumers show very slight interest. Copper and brass products are in somewhat improved inquiry, however.

Calendar

SHOWS

April 3-16—New York, Second Annual Electric Automobile Show, Showroom of the New York Edison Co.

FOREIGN SHOWS

Feb. 18-27—Brussels, Belgium, Ninth Exhibition of Agricultural Machines and Implements, Palais de la Cinquantenaire.

March, 1922—Santiago, Chili, Annual Automobile Show.

April 16—Mexico City, Annual Automobile Show, Auspices of the Automotive Division of the American Chamber of Commerce.

April 22-May 1—Prague, Czecho-Slovakia, Fourteenth International Automobile Exhibit.

May, 1922—Quito, Ecuador, Agricultural Exposition, celebrating Centenary of Ecuador. Automotive Section.

Sept. 1922—Rio de Janeiro, Brazil, Automobile exhibits in connection with the Brazilian Centenary Associcao Automobilista Brazileria.

CONVENTIONS

May 10-12—Philadelphia, Ninth National Foreign Trade Convention of the National Foreign Trade Council.

June 11-15—Milwaukee, Annual International Convention of the Associated Advertising Clubs of the World.

June 26-July 1—Atlantic City, Twenty-fifth Annual Meeting of the American Society for Testing Materials, Chalfonte-Haddon Hall Hotel.

August 28 - Sept. 2—Detroit, National Safety Congress.

Sept. 18-23, 1922—Rome, Italy, Second Annual Meeting of the International Chamber of Commerce.

S. A. E. MEETINGS

Detroit, Feb. 24, Mar. 24, April 28, May 26.

Argentina Absorbing Old Stocks of Cars

No Longer Serious Menace to Trade Stability—City Sales Show Improvement

BUENOS AIRES, ARGENTINA, Jan. 16 (*by mail*)—Racing here this summer has had more than the usual interest, both from a commercial as well as a sporting point of view, because of the fight for supremacy between American and European cars. So far the latter have not managed, despite their efforts, to wrest the honors away from the American cars.

A year ago the public here had worked itself up to a high pitch of enthusiasm over the reports of the wonderful cars that would shortly arrive from some of of the well known European factories, and it was generally thought by the man on the street that the American cars had "seen their day." Even some of the importers caught the fever and rushed over to Europe to secure agencies.

American Cars Helped

The result has been sadly disappointing to many of them, and the public is now beginning to realize that "all is not gold that glitters." It is perhaps just as well that this has happened, because nothing could have been more helpful in the long run to the well known American cars.

The past month or two has seen a steady improvement in the local automobile trade, especially in city sales. Farming districts, so far, have not come up to expectations, due, no doubt, to the low prices of produce, but the late summer will probably show some movement.

The old car stocks, accumulated at the end of 1920, are gradually being absorbed, and to-day they do not represent any serious menace to the stability of the trade as a whole.

Dealer Mortality Not Heavy

Dealer mortality has not been heavy among those regularly in the trade. There has been, of course, considerable weeding out among the firms that rushed into the automobile business, as a side line, during the boom, without any previous experience and without realizing the organization required for a successful business.

The Argentine automobile importers are doing excellent work in cleaning the trade of harmful practices.

In the month since the above was written, Argentine exchange has improved materially, and wheat prices have ascended at a rate similar to that in the United States markets. This improvement in wheat prices comes just as the Argentine crop is entering the market, and in combination with the bettered exchange, it is expected that the Argentine "camp" buyer will again enter the buying market.

New Company Is Formed to Buy Visible Pump Co.

FORT WAYNE, IND., Feb. 14—A company capitalized for $750,000 has been formed by local people and capitalists of Findlay, Ohio, for the purpose of taking over the Visible Pump Co., whose general offices are in this city and whose factory is at New Haven, Ind.

The new company has secured an option on the plant of a former Findlay motor car company. This plant has 76,000 square feet of floor space, a modern heating plant, a considerable amount of mechinery and is connected by a spur with a nearby railroad. Operations will be commenced in the new plant shortly. The company makes pumps which are covered by patents owned by the August Bowser estate. S. B. Rohrer will continue as the president.

MOTOR BOAT S. A. E. MEETING

NEW YORK, Feb. 14—The Society of Automotive Engineers has arranged a program for its motor boat meeting to be held at the Hotel Commodore on Feb. 21 at 10:30 a.m. inclusive of papers by Elmer A. Sperry, on Compound Oil Engines for Marine Uses, by Commander Ernest Nibbs, formerly of the British Navy, on the development and building of Diesel engines, and by Albert Hickman on surface propulsion in general and with special reference to its use with the sea sled type of hull. Joseph Van Blerck will be chairman of the meeting. The technical session will be followed by an informal luncheon, at which William Washburn Nutting will act as toastmaster.

British Prospect for Tractors Poor

Indications Point to Farm Work Being Done by Syndicates Owning Fleets

LONDON, Feb. 4 (*by mail*)—The Agricultural and General Engineers, Inc., a post-war combine of over half a score of leading and, some of them old established, British engineering firms, largely concerned with farm plants, has passed the interim dividend on its first and second cumulative preferred stock. It hopes to be able to meet this and other charges after the close of the fiscal year, March 31.

Lower Prices Made

Two or three of the companies in the combine are makers of farm tractors and tractor implements, business in which has been very dull throughout the year. Just now the prospects of the tractor industry are least promising of any among mechanical industries, largely because of the serious drop in the price of farm and land stuff, cattle and the like. Farmers say that all round they are not averaging 35 per cent of last year's prices, though in some cases those prices were not justified and, in the course of things, must have dropped with the reduced cost of labor and materials.

Recently there has been a fall in British tractor prices. The Austin is now quoted at £300. The Fordson has been marked down for some months to £205, but the output at Cork is reported not to exceed 12 to 14 machines a week, and Ford dealers, who all are required to stock one tractor, find the business irksome. Appearances point to the British tractor business, for some time at least, having to depend on syndicates of contractors owning a score or more and contracting for plowing and the rest of operations after the fashion of the steam cable-plow firms.

The first cost of tractors is but one of the difficulties of this business, probably maintenance troubles are a vastly more important factor. Automobile dealers as a class have little practical interest left in tractors, most of them declaring that there is nothing for them out of the sales.